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ABSTRACT

This bibliography provides brief descriptions of current literature intended to aid facility planners. The material is organized under nine topics: (1) general references, (2) periodicals frequently containing articles pertaining to educational facilities, (3) facility planning--a component of comprehensive educational planning, (4) overview of educational facility planning, (5) tactical facility planning--districtwide building survey, (6) operational facility planning--planning an individual building, (7) the architect and his work, (8) moving in and settling down, and (9) related topics. (MLF)

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EDUCATIONAL FACILITIES PLANNING

A SELECTED, ANNOTATED BIBLIOGRAPHY

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PART I: GENERAL REFERENCES

A. Basic Text

1. Council of Educational Facility Planners. Guide for Planning Educational Facilities. Columbus, Ohio: The Council, 1969.

   This is the primary publishing effort of the Council, which was established to deal with problems of school plant planning and construction. The publication provides planners with the basic principles of educational planning. Emphasis is placed on the educational programs which facilities must accommodate. The importance of human resources and involvement in the planning process is described as are the broad steps necessary to logically plan, construct, and occupy new facilities.

B. Other General References

1. American Association of School Administrators. Schools For America. Washington, D. C.: The Association, 1967.

   The whole process of urbanization has cast school building problems into a new perspective. As people in increasing numbers have moved from sparsely settled areas toward large centers of population, schools have inevitably become larger, and school planners are challenged to create an environment in which the pupil can maintain his individuality and to establish circumstances in which the unique qualities of his personality and his special interests can be recognized and nurtured. This publication attempts to provide new information, new insights, and new guidelines that will lead to school plants which will maximize the kind of environment described above.

2. American Association of School Administrators. Planning America's School Buildings. Washington, D. C.: The Association, 1960.

   This book is a general text designed to aid in planning and building schoolhouses. The usual topics are discussed. Emphasis is placed upon educational needs, the content of the curriculum, and instructional methods as they are related to the beliefs and life activities of people.

3. Boles, Harold W. Step By Step to Better School Facilities. New York: Holt, Rinehart, and Winston, 1965.

   A text designed primarily for university classes in school plant planning, this book presents the steps and planning principles for planning and constructing a school building. Parts III and IV are the major departure from standard text content. In Part III the author discusses planning for five specific factors. In Part IV he discusses the perennial question of whether to modernize or build new plants.

4. Building Research Institute. School Building Research. Washington, D. C.: The Institute, 1963.

   This publication is the report of a program held as part of the Building Research Institute 1962 Fall Conference. Topics considered include: definition of school buildings needs; developing the strategy for meeting future school building needs; comprehensive campus planning: case studies of design for long-range planning; recent research for school facility design, equipment, and service; recent research in the management and operation of school facilities; and conference summary: needs for further research.

5. Castaldi, Basil. Creative Planning of Educational Facilities. Chicago: Rand McNally and Company, 1969.

   This comprehensive treatment of the plant planning field emphasizes creative and systematic planning. Specific procedures likely to result in successful facilities are described in considerable detail. Included in this text is consideration of elementary, middle, and secondary schools as well as college and university facilities. In addition to planning new facilities, rehabilitation, remodeling, and modernization is described.

6. Conrad, M. J. and Griffith, William. "Organizational Character of Education: Facility Planning and Business Management," Review of Educational Research, 34:470-484, October, 1964.

   This article is one of seven which constitutes the October 1964 issue in which the literature for the three year period from October 1961 to October 1964 dealing with educational organization, administration, and finance was reviewed. Topics covered here deal with facility planning and business management. Sub-topics are: educational planning, environmental controls, school and class size, school construction cost accounting and cost analysis, personnel and service operations. For references to the literature of this period one may wish to refer to this article. An extensive bibliography is provided.

7. Dahnke, Harold L., et al. Higher Education Facilities Planning and Management Manuals. Boulder, Colorado: Western Interstate Commission for Higher Education, 1970.

   Presents a "recipe" approach to space analysis and management with forms and precise directions illustrated by examples.

8. Davis, J. C. The Principal's Guide to Educational Facilities Design, Utilization, and Management. Columbus, Ohio: Merrill Publishing, 1973.

   As the title would suggest, this book covers a range of topics concerned with the relationship between the principal and his building. Major topic areas include (1) the principal's role in facilities development, (2) instructional equipment and furniture, (3) utilization, (4) maintenance and remodeling, (5) current educational issues regarding facilities. The book also contains a chapter on school safety and security.

9. Dober, Richard P. Campus Planning. New York: Reinhold Publishing Company, 1963.

Some history of campus planning -- descriptions of existing institutions -- principles illustrated with actual situations -- attention to important planning concepts.

10. Englehardt, Nickolaus L. Complete Guide for Planning New Schools. West Nyack, New York: Parker Publishing Company, 1970.

This, as the title implies, is a general text on the area of school plant planning. Following is a list of topics covered: organizing schools, innovations such as continuous progress, library, electronic learning aids, modifiable classroom, sites, and middle schools. In addition facilities for the following subject areas are included: science, mathematics, arts, health and physical education, business education and administration center.

11. Hall, Edward T. The Hidden Dimension. Garden City, New York: Doubleday and Company, Inc., 1966.

An anthropologist looks at the effects of amount of space, crowding, and distance regulation on animal and human behavior -- genuine implications for space planners.

12. Handler, Benjamin. Economic Planning for Better Schools. Ann Arbor: University of Michigan, 1960.

This reference is a study which develops concepts and techniques suitable to an integrated approach to school building problems of the immediate and foreseeable future. It treats revenue, costs, financing, educational needs, obsolescence, location, and design as inseparable parts of a mutually interlocking network of factors to be considered in school house planning and construction.

13. Herrick, John H., and Others. From School Program to School Plant; A Discussion of Problems of Planning School Buildings. New York, Henry Holt and Company, 1956.

This work is a general text designed to give graduate students in educational administration, practicing school administrators, and school-plant consultants: 1) a basic understanding of the goals to be achieved and of the problems to be encountered in school plant planning, 2) an appreciation of the role that architects and other designers play, and 3) a basis upon which they can reach decisions and give approvals as required.

14. Leu, Donald J. Planning Educational Facilities. New York: The Center for Applied Research in Education, 1965.

The author's analysis of emerging curriculum changes and their direct effect of school buildings is excellent. The substantial portions of the book directed to the specifics of planning, to discussion of obsolete school buildings, to estimation of future enrollment, to the development of educational specifications, to selection of the school

architect, and to the financing of building programs, provide valuable aids to those involved in planning school buildings.

15. McGuffey, C. W. Systematic Planning for Educational Facilities. SimuSchool: Chicago Public Schools, 1973.

    A description of a facilities planning/management system called FRAMES--Facilities Resource Allocation Management Evaluation System. The basic components of FRAMES are (1) needs assessment, (2) facilities programming, (3) resource allocation and distribution, (4) facilities management, and (5) evaluation. Particular discussion is given to the component of needs assessment which is seen as critical to the entire management system.

16. National Council on Schoolhouse Construction (now Council of Educational Facility Planners). Planning Facilities for Higher Education. Nashville: The Council, 1960.

    The principles of plant planning developed by the National Council on Schoolhouse Construction over the past several decades have been found to be applicable to facility planning at all educational levels. This report applies those principles to the planning of higher education facilities. It is composed, insofar as is possible, of the opinions of a large number of specialists and represents the consensus of all the members of the Council who have indicated concern with college planning.

17. Parker, Floyd G. and Smith, Max S., editors. Planning Community Junior College Facilities--A Look Into the Twenty-first Century. East Lansing, Michigan: Continuing Education Service, Michigan State University, 1968.

    Collection of papers and talks presented at a conference on planning community colleges -- treatment of issues and problems.

18. Pinnell, Charles and Wacholder, Michael. Guidelines for Planning in Colleges and Universities. Austin, Texas: Coordinating Board, Texas College and University System, 1968 5 volumes.

    Developed for use in the Texas system but has much general material--volume 1 describes planning system and the other four volumes treat financial planning, land use and traffic, facilities studies and utilities.

19. Toffler, Alvin (Editor). The Schoolhouse in the City. New York: Frederick A. Praeger, 1968.

    This excellent book is concerned with planning schools in urban setting. The contributing authors are nationally known and respected. The book includes many diverse topics including decentralization, alternatives to urban public schools, educational parks, combined occupancy, and disadvantaged pupils.

PART II: PERIODICALS FREQUENTLY CONTAINING ARTICLES PERTINENT TO EDUCATIONAL FACILITIES

1. American School Board Journal
2. American School and University
3. Architectural Forum
4. Architectural Record
5. Nation's Schools
6. School Business Affairs
7. School Management
8. Schoolhouse
9. CEFP Journal

NOTE: Educational Facilities Laboratories regularly publishes pamphlets and books related to school facilities and program. These publications are usually very descriptive and well illustrated.

PART III: FACILITY PLANNING--A COMPONENT OF COMPREHENSIVE EDUCATIONAL PLANNING

1. Brieve, Fred J., Johnston, A. P., and Young, Ken M. Educational Planning. Worthington, Ohio: Charles Jones Publishers, 1973.

   A planning workbook which depicts a twelve step comprehensive planning model. Planning is explicated as a rational administrative process based on hard information and good research. Materials and practical examples are presented for use in converting process into procedure.

2. Center for the Advanced Study of Educational Administration. SPECS: School Planning, Evaluation, and Communication System. Eugene, Oregon: General Learning Corporation, 1972.

   A five component comprehensive educational planning manual. The components include:

   1. A systems analysis of the school district.
   2. Program cost accounting and budgeting model.
   3. Program planning, implementation and evaluation.
   4. Community-based broad goal definition.
   5. Assessing achievement of the district's broad goals.

   Provides comprehensive models for planning and their illustrative implementations.

3. Hencley, Stephen P., and Yates, James R. (editors). Futurism In Education: Methodologies. Berkeley, California: McCutchan, 1974.

   A series of rather sophisticated articles relating to futuring and planning techniques in educatic . Includes delphi, ariole, contextual mapping, monte carlo, and 10 other recent methods for studying the future. Provides acquaintance with recent developments in the area of educational futures and their environments and a

most helpful glossary of futuring and simulation and information for using probability techniques and random numbers in futuring techniques.

4. Higgins, K. Ronald, and Conrad, M. J. A Data System For Comprehensive Planning In Education. Columbus, Ohio: Project Simu-School, September, 1973.

   A report on a base data system designed for comprehensive educational planning at the local school district level. The report defines comprehensive educational planning as a continuous process of (1) establishing goals, (2) gathering data, (3) forming and assessing alternative means of goal achievement, and (4) making decisions about these alternatives. A comprehensive planning model is displayed along with a discussion of levels of educational planning. The data system is then presented in detail in the form of fourteen "trees" and four data levels. A source for a good overview of comprehensive educational planning and a detailed data system for planning information.

5. Project Simu-School, A Futures Primer For Local Education Agencies. San Jose, California: Project Simu-School, Santa Clara County Component, September, 1974.

   A series of exercises and materials designed to sensitize citizens to rapid change and encourage them to think in terms of what the future may bring. Contains an annotated futures bibliography and glossary.

6. Tanner, C. K. Designs For Educational Planning: A Systematic Approach. Lexington, Mass: Heath Lexington Books, 1971.

   The book is directed toward solution of educational problems related to program evaluation, program planning, decision-making, MBO assessment, cost/effectiveness analysis, population projection, cost analysis, and food services management. A reasonably technical approach, the book discusses probability theory, Bayesian statistical theory, survival ratio techniques, PERT and Critical Path methods.

PART IV: OVERVIEW OF EDUCATIONAL FACILITY PLANNING

1. Guide for Planning Educational Facilities, Chapter 1.

2. Creative Planning of Educational Facilities, Chapters 1 and 17.

3. Planning Educational Facilities, Chapters 1 and 6.

4. Schools for America, Chapters 1 and 5.

5. Cockarell, J. L. "Ten Current Trends in School Planning." Nation's Schools, 94:15 (July, 1974), 15-17.

   The article cites and discusses ten significant trends in school

planning; trends include (1) open space modification, (2) design/build construction, (3) lease-back arrangements, (4) "alternative" homes for schools, (5) non-traditional design for career centers, (6) environmental considerations, (7) heterogeneous pod grouping in high schools, (8) magnet schools, (9) community schools, (10) alternative schools.

6. Conrad, M. J. Four Steps to New Schools. Columbus: The Ohio State University and Ohio School Boards Association, 1962.

   This booklet presents in concise and graphic fashion the fundamental processes involved in planning and constructing school facilities. It is an ideal starting point for the inexperienced school planner and for board members who wish a logical and orderly approach to the problem of such planning.

7. Cornell, Francis G. "Plant and Equipment," Encyclopedia of Educational Research, edited by Chester W. Harris. New York: The MacMillan Company, 1960, pp. 1008-1031.

   This plant and equipment section of this encyclopedia deals with the school facilities field. Its historical development of the school housing picture and its extensive bibliographical references make this selection of great value for one doing a literature search in this field. A bibliography of 170 references is included.

8. Englehardt, N. L., Sr. "Flow Charts of School Building Planning," American School and University, pp. 117-120, 1954-55.

   This article presents a discussion of various means of organizing for building and program planning. Four illustrated flow charts or diagrams of this organizational process are helpful. The list of 15 stages through which a building project usually passes is excellent.

9. Grieder, Calvin. "Let's Not Bungle Planning By Looking Too Far Ahead." Nation's Schools, 83:4, January 1969.

   This brief article points out the very real dangers of planning for the distant future. Though planning is supported in general, the time span involved must be considered.

10. Liebesking, M. "Critical Path Method in School Building Design," American School and University, 37:36-7, February 1965.

    The Critical Path Method is a management tool that gives the administrator a view of all the steps in the design and construction of an educational building. Perhaps the most solid benefit of the Critical Path Method is that it speeds up the planning process.

11. Woodgate, H. S., Planning by Network. London Business Publications Limited, 1967.

This book is concerned with planning by network. P.E.R.T., Critical Path, and other network planning models are described in great detail. This treatment of the topic of network planning is exceptionally thorough and complete.

PART V: TACTICAL FACILITY PLANNING-- DISTRICT-WIDE BUILDING SURVEY

A. The Survey

1. Creative Planning of Educational Facilities, Chapter 2.

2. Guide for Planning Educational Facilities, Chapter 2.

3. Planning America's School Buildings, Chapter 7.

4. Planning Educational Facilities, Chapter 2.

5. Adams, V. A. "Developing A Master Plan," College Management, 9:6 (June, July, 1974), 10-13.

   The article gives suggestions for procedures in developing a master plan at any level with particular comments on establishing a time-table, determining breadth of participation, and developing the final report. Problems encountered in the process are described and suggestions for solution given. The author supprts strongly the master plan concept for its primary and secondary benefits. A case study of the experience Connecticut had in developing a master plan for higher education is provided.

6. American Association of School Administrators. Management Surveys for Schools: Their Uses and Abuses. Washington, D. C.: The Association, 1964.

   This report furnishes a background against which sound decisions can be made as to the necessity for management surveys and under what conditions they may be helpful in a particular school district. The sections dealing with "When" is a Survey Useful?" and "Where to Get Help?" will be valuable to board of education and superintendents.

7. Leu, Donald J., and Forbes, John F. What is Involved in Conducting a School Plant Survey. Professional Series Bulletin, No. 9 East Lansing Bureau of Research and Service, Michigan State University, 1965.

   A guide for improving public school facilities, this publication is designed to help school districts identify some of the means by which they can develop satisfactory long-term school building programs.

8. Roaden, O. P. "Surveys: Valuable Tool for Planners," American School and University, 37:23-5, May 1965.

   The survey provides a basis for diagnosis, but not the cure. Three basic types of surveys are identified. These are: educational, plant and facilities, and comprehensive.

9. Sumption, Merle R. How to Conduct a Citizen's School Survey. New York: Prentice-Hall, Incorporated, 1953.

This book provides a step-by-step outline for organizing citizens for work, collecting necessary information, interpreting information in the light of the local situation, and developing a long-range educational plan. In essence, it shows how a community can organize and conduct a school survey which will give the board of education long-range plan for meeting the educational needs of the community.

10. Typical survey reports, The Ohio State University, College of Education, Educational Administration Faculty.

B. The Educational Program

1. Determining the Program and Its Details

a. Guide for Planning Educational Facilities, pp. 29-30.

b. Creative Planning of Educational Facilities, pp. 24-25.

c. Planning America's School Buildings, Chapter 7.

d. Planning Educational Facilities, Chapter 3.

e. Conrad, M. J., and Wohlers, A. E. "Cooperation Plus -- The Road to Better Schools," Ohio School Boards Journal, 5:18-19, March 1961.

_____. "School Plants for Tomorrow's Schools." Ohio School Boards Journal, 5:13, 19, May 1961.

_____. "School Plants for Tomorrow's Curriculum." Ohio School Boards Journal, 5:15-17, April 1961.

These three articles report some of the procedures and findings of The Associated Schools Project sponsored by the School Plant Division of the Bureau of Educational Research and Service, The Ohio State University. This project was designed to determine whether or not the British consortium, long used in business, could be effectively used in planning new school buildings. It was hoped that a loose association of school districts, meeting with outstanding specialists on curriculum and the school program, could find independent solutions to common problems and effect certain building economics.

f. Educational Facilities Laboratories. "How to Make Sure Great Schools Get Designed for Your District." The American School Board Journal. 160:25-27 (August) 1973.

The article emphasizes the need for the building to meet the needs of the intended educational program, or the building may be a failure no matter how beautiful it is. Schools should serve the people inside of them, instead of the egos that exist outside of them.

g. Green, Alan C. (ed.) Educational Facilities With New Media. Washington, D. C.: Department of Audio-visual Instruction, National Education Association, 1966.

To make maximum use of the innovative developments in the field of audio-visual media, special considerations must be made in the facilities which will house their use. This book is an excellent source for ideas in this area.

h. Educational Facilities Laboratories. Educational Change and Architectural Consequences. New York: The Laboratories, 1968.

This publication is concerned generally with change occurring in education. It is the aim of the document to encourage creative thinking by planners of new buildings. While including many thought provoking illustrations, the booklet also contains excellent sections concerning class size, independent study, and small group and large group instruction.

i. Shane, Harold G., and Share, June Grant. "Future-Planning and the Curriculum." Phi Delta Kappa, 49:372-337.

The authors present a model for planning curriculum for the future. The steps in the procedure are discussed as in the history leading up to future-planning. This article would be helpful in preparing a program prior to construction of an educational facility.

j. The Work Conference in Curriculum, Instruction and Administration, The University of Denver Building Design. The Challenge of Technology in Planning for Education. Denver: School of Education University of Denver, 1961, pp. 42-59.

In this report the committee for building design stresses the need for planning for technological change in education and makes some suggestions for adaptation of school plants for the ever changing educational picture.

2. Some Curricular Innovations That May Have Program and Facility Implications.

a. Creative Planning of Educational Facilities, Chapter 17.

b. Anderson, Robert H., and Mitchell, Donald P. "Team Teaching, New Learning Concepts Demand Changes in School Plant Design," The Nation's Schools, 65:75-82, June 1960.

This article claims study carrels are practical in elementary schools if ample resource materials are available, if there is a planned program of independent study, and if study skills are taught. Carrels, when properly used, become the "prestige" learning places and are preferred by youngsters. This article suggests the ways and means by which carrels can be utilized to utmost advantage in elementary schools. Included is a chart, "Seventeen Steps to Independent Study."

c. Brubaker, Charles W., and Perkins, Lawrence B. "Sketch Book--Space for Individual Learning," School Executive, 78:43-58 February 1959.

Innovative designing for individual learning has led the authors to design three kinds of space: Individual studies "Q-space," individual teachers' studio, and group spaces of various kinds. Here are illustrated in sketch form these basic components of a school facility designed to stimulate individual learning.

d. Colbert, C. R. "Perception Core School," The Nation's Schools, 65:79-84, March 1960.

The author attempts to design a facility which will accommodate new learning-teaching concepts. A tri-departmental building organization surrounding a "large plaza which provides for the interaction of recreation, dedication, accomplishment, example, unusual interest, and pride" (the Perception Center), and a vertically related central library express the author's conception of facilities needed to accomplish this accommodation.

e. Congrieve, Willard J. "Toward Independent Learning," North Central Association Quarterly, 37:298-302, Spring 1963.

In schools which contain profuse facilities for independent study such as instructional materials centers and language laboratories,time must be provided for students to use these vast resources. When highly intelligent and motivated student bodies are taught by a genuinely competent faculty, exposure time in a class setting must be reduced so as to allow teachers to work with small student groups and to counsel with individual students working through special problems. The author reports how The Laboratory Schools of The University of Chicago have met this problem through block programming.

f. Cruckshank, W. M. and Quay, H. C. "Learning and Physical Environment: The Necessity for Research and Research Design," Exceptional Children (December, 1970), 261-268.

A provocative discussion citing the lack of research concerning the relationship of physical environment and learning. The authors note that most research is construction-oriented rather than education and environment oriented. Research designs for future study are presented. The goal of such research is to sensitize planners to student needs.

g. Educational Facilities Laboratories. Design for ETV: Planning for Schools With Television. New York: The Laboratories, 1960.

The primary focus of this study is the design of a facility for the educational program; that is, spaces and equipment for learning in the school. Particular emphasis is placed on the effective use of television in the classroom. Here one would expect to find discussions of the equipment necessary for an educational television program, but also one can find discussions and illustrations of other building and equipment factors such as space dividers,

a teachers' center, flexible glossary of ETV terminology and the list of references and sources is quite useful.

h. Educational Facilities Laboratories. Schools for Team Teaching. New York: The Laboratories, 1961.

This report presents representative examples of recent and planned elementary and junior high schools designed to house team teaching programs. The pictures, illustrations, and floor plans presented are particularly helpful in depicting how school facilities can be planned and constructed to accommodate this specialized teaching technique.

i. Educational Facilities Laboratories. Places and Things For Experimental Schools. New York: The Laboratories, 1972.

Curricular innovations and their implication for facilities are stressed in this report. Topics treated include found space, modernization, open plans, reachout schools, community schools and other operational variables in such areas as staff selection, staff training, administration, organizational structure and length of school day and year. Also includes a variety of sources for planning contacts regarding innovations and techniques for improving the quality of school buildings and equipment.

j. Educational Facilities Laboratories. School Scheduling by Computer -- The Story of GASP. The Laboratories, 1964.

This booklet is an excellent discussion of the GASP approach to computer scheduling. The techniques, advantages, and disadvantages are pointed out. Several successful applications of this approach to scheduling are described in detail. The use of computer scheduling is practically a necessity for many curricular innovations such as modular scheduling and independent study.

k. Gores, H. B. "The Schoolhouse of the Future." National Elementary Principal, 52:1 (September, 1972), 10-13.

The school of the future will be a "center" within the community for a myriad of social services for all people, young and old. At the same time architectural improvements and changing attitudes may radically change our conception of the schoolhouse and its purpose. Gores cites examples of the school of the future as they exist now.

l. Green, Alan C. "The Schoolhouse Revisited: Problems and Missed Opportunities," Phi Delta Kappan 55:5 (January, 1975), 360-362.

The article notes some errors made in school planning in the past and offers advice for overcoming them in the future. He notes the meagerness of evaluation of the $100 billion capital investment of the last two decades and the lack of demographic data used by many school planners. Other problems with environment, cookbook planning, exorbitant architecture, lack of involvement, and technology first, people second are discussed.

m. Kenny, James B. "What Can Computer Scheduling Programs Do?" Nation's Schools, 82:64-66, Nov. 1968.

This article describes various types of computer scheduling and their strengths and weaknesses. The following programs are included: Stanford School Scheduling System, SHARE, New England Educational Data Systems (NEEDS), and Generalized Academic Simulation Program (GASP). It is clearly emphasized that while GASP is superior to manual scheduling, SHARE and NEEDS, GASP does require technical support often not available.

n. Meeker, Robert J. and Weiler, Daniel L. "A New School for the Cities," Education and Urban Society, Vol. 3, No. 11, February 1971.

The authors have incorporated many of the new ideas affecting education into their "new school for the cities." Based on the belief that young people who can survive in the inner city have distinct and valuable qualities, the authors proceed to describe in some detail the program, governance procedures, and support systems of their "new school." Open and structured curriculums, work program, extended school day and year, differentiated staffing, student tutorial program, and extensive community involvement are some of the elements of the "new school." The proposal is an exciting and challenging one, well worth considering.

o. Mills, G. E. "The How and the Why of the 'Middle' Schools," Educational Forum, 24:389-395, May 1960.

Based on observations of 320 physical, mental, emotional, and social growth characteristics and their teaching implications for boys and girls, conclusions were drawn that youngsters in K-4, in 5-8, and in 9-12, had greatest similarities of growth patterns. This led to the establishing of primary schools (K-4) devoted to the development of basic skills and the extension of interests and appreciations; of middle schools (5-8) concerned with the development of basic skills, but also with the goal that students become increasingly self-directing; and of high schools (9-12) which are typically oriented toward college entrance. Physical facilities and equipment as well as program are to be tailored for particular grade levels.

p. Nation's Schools. "Computer-Assisted Instruction," Nation's Schools, 82:49-68, October 1968.

This special report covers the general topic of CAI in some detail. Many aspects of CAI are discussed including the current status of CAI, the cost, how students perceive CAI, uses of CAI, commercial consortiums and their involvement, USOE's involvement concerns of administrators, and specific examples of CAI in action. The report is very concise and complete.

q. Nelson, V. C. R. "Time...Team...Tectonics," California Teachers Association Journal, 61:28-30, October 1965.

An educational plant of unique design and a spectacular array of electronic teaching aids and features which remove this school a generation or two from the traditional schoolhouse. To complete

the triple-threat partnership of flexible scheduling and instruction-oriented architecture, the Lincoln Faculty practices a well-adapted brand of team teaching.

r. Perry, Arnold. "Teaching by Television in Today's Schools," Educational Forum, 24:389-395, May 1960.

The use of TV in schools is rapidly increasing and a number of experimental programs are planned or underway. Designing, producing, and scheduling of programs requires a "Team approach" to curriculum determination and methods of teaching. How these concepts affect schools, the pros and cons of teaching by TV and the results of research on the effectiveness of TV instruction are adequately presented by the author.

s. Weinstock, Ruth. The Greening of the High School. New York: Educational Facilities Laboratories, 1973.

Report on a conference on the secondary school. Discusses the life styles of adolescents, and ways to accommodate them. Good discussion and source for open curriculums and alternative educational programs.

3. Additional entries concerning program may be found in Part V, Section B, Educational Planning, "Establish Details of Program."

C. Enrollments

1. Projections.

a. Guide for Planning Educational Facilities, pp. 26-29.

b. Creative Planning of Educational Facilities, pp. 22-23.

c. Planning America's School Buildings, Chapter 7.

d. Planning Educational Facilities, pp. 19-24.

e. Aizawa, Herman M. "A Technique for Projecting Pupil Enrollments in Undeveloped and Changing Areas by Utilizing Federal Census Data." Unpublished Ph.D. Dissertation, The Ohio State University, 1974.

The study was undertaken for the purpose of investigating a method of increasing the accuracy of long range or saturation enrollment projections; using a multiple regression analysis. Regression equations were developed and analyzed for their efficiency in making enrollment projections. Thirteen variables were identified as valid predictors. They included: occupation, highest grade attended, age of children, race of head, household type, units in structure, monthly rent, tenure, value of property, year built, bedrooms, age of head and total income. The latter five were deemed most significant.

f. Brown, Roscoe, Jr. Predicting School Enrollments. New York: School of Education, New York University, 1961.

This monograph has been prepared to assist school personnel to more accurately predict future school enrollments. A discussion is presented of three projection techniques and a step-by-step method is offered for computing a school enrollment projection. The importance of a good school census is emphasized.

g. Gilmore, William, et al. ENSIM: A User's Manual for a Land Use Analysis-Based Enrollment Simulation. Research Report Number Eleven, San Jose, California: Project Simu-School, 1974.

The report describes one method which can be utilized to study the undeveloped land in a growing community, and then translate the projected new dwelling units into projected new enrollments. An enrollment projection-saturation simulator for rapidly growing districts with its basis on past and future conditions.

h. Gottlieb, Abe. "A Planning Approach to School Enrollment Forecasts," American School Board Journal, 128:68-69, February 1954.

In guiding urban areas toward optimum development, a most important activity is planning for desirable school locations and for adequate classroom space. The preparation of a school building program should include a thorough analysis of school needs, not the least of which involves enrollment projection. The author provides a discussion of background factors, of planning factors, and of changes to be anticipated.

i. Griffith, William J. "Variables Affecting Public School Enrollment Change." Unpublished Ph.D. dissertation, The Ohio State University, 1964.

An analysis of 25 factors which affect school enrollments with particular attention to some of the socio-economic factors identified by Jonassen. Dr. Griffith concludes that school districts and municipalities need to improve their programs for population data collection.

j. Herrick, John H. "Estimating Future School Enrollments in Rapidly Growing Communities," Educational Research Bulletin, 32:92-94, 111,112, April 15, 1952.

The author describes two cases in which ordinary methods for estimating future school enrollments would be impractical. The development of ranges in enrollment gives educational planners a look at possible enrollment patterns and allows them to develop contingent plans. In a like manner, the use of saturation procedures for estimating long-range enrollment coupled with the usual survival rate technique for estimating short-range enrollment, allows school plant planners to provide for immediate action recommendations consistent with the long-range picture.

k. Larson, Knute G., and Strevell, Wallace H. "How Reliable are School Enrollment Forecasts?" School Executive, 71:65-68, 1952.

Even though enrollment forecasts have not proved highly reliable, particularly when considering the high projection, a necessity remains in a school district to consider future enrollment when involved in planning school plant construction. Forecasters are in extensive agreement that some basis of total population estimate should be a basic consideration in enrollment forecasting.

l. Strevell, Wallace H. "Techniques of Estimating Future Enrollment," American School Board Journal, 124:35-38, March 1952.

Four practical methods which school personnel may use to project future enrollments and to determine the space needs of school buildings are discussed. These methods are: 1) census class projection, 2) retention ratio projection, 3) housing projection, and 4) population forecasts. The author cautions, however, that blind use of any technique can be, at the very least, misleading. "Prudential planning," he says, "necessitates annual review of the trend projections."

2. Declining Enrollments.

a. Educational Facilities Laboratories. Fewer Pupils/Surplus Space. New York: The Laboratories, 1974.

A report dealing with future population projections and strategies and procedures that follow when a population is too thin for existing school facilities. The problems have changed from what to do about overcrowding, to what to do about empty classrooms, and are treated extensively in this report. Includes case studies of districts which have had significant enrollment decline and planned successfully for it.

b. Eisenberger, K. E., and Keough, W. F. Declining Enrollment: What to Do. Volume II, AASA Executive Handbook Series, 1973.

With the current and predicted enrollment decline in the public schools, administrators are faced with hard decisions concerning building utilization. This handbook gives suggestions and techniques for dealing with enrollment decline. Included are sections Enrollment Prediction, School/Community Relations, Personnel, and Facilities. Also contained is an appendix of paper instruments for analysis of enrollment situation.

c. Gardner, Dwayne E. "Unraveling Enrollment Trends: The View From Here," CEFP Journal, 13:1 (February, 1975), 2-3.

An overview of the enrollment problems and the need to avoid making hasty, short-sighted decisions in view of the recent declines. Optional uses of empty facilities and the need for planning wisely and taking plenty of time in closing facilities

are emphasized. Dr. Gardner recommends taking positive action in closing a school: rent it, lease it, create an alternative use, sell it, or tear it down; don't simply board it up and mothball it.

d. Green, Alan C. "Planning For Declining Enrollments," School Review, 82 (August, 1974), 594-600.

Cooperation with other groups and agencies will open up new possibilities so that as enrollments decline, communities can make effective use of vacated or under-utilized facilities. Green emphasizes the need to reconnect the school to the community in social services, arts, libraries, job training, recreation, and health. Participatory planning and additional demographic and mobility data are needed for enrollment planning in every community.

e. Sargent, Cyril G. "Fewer Pupils, Surplus Space: The Problem of School Shrinkage," Phi Delta Kappan, 56:5 (January, 1975), 352-357.

Some tested answers are provided for closing a school, dealing with empty classrooms and declining enrollments. Provides insight into enrollment projections and trends and the absolute necessity of having a shrinkage plan.

f. Sargent, Cyril G. "Save It or Sell It," Nation's Schools and Colleges, 1:2 (October, 1974), 16-22.

Stresses the need for planning, prior to the time classrooms are empty, for declining school enrollments. Allow plenty of lead time before acting and involve staff and parents. Ideas on what to do with surplus space are presented along with the opinion that the birth rate will continue to decline past 1980.

g. "What To Do If Shrinking Enrollment Forces You To Shut a School," Nation's Schools, 91:2 (February, 1973), 12-13.

Recommends alternatives to closing a school: various ideas for leasing, conversion of use, renting, sharing space, and converting to a year-round program placing additional demands on facilities. A successful plan for closing schools, used by a California district is also outlined.

D. Plant Evaluation

1. Guide for Planning Educational Facilities, pp. 30-34.

2. Creative Planning of Educational Facilities, pp. 46-52.

3. Planning Educational Facilities, pp. 24-28.

4. Conrad, M. J. A Manual for Determining the Operating Capacity of Secondary School Buildings. Columbus Bureau of Educational Research and Service, The Ohio State University, 1954.

5. _____. "A Technique for Determining the Operating Capacity of Secondary School Buildings." Unpublished Ph.D. dissertation, The Ohio State University, 1952.

This dissertation provides the historical and theoretical background for the Conrad formula for determining operating capacities of school buildings. The discussion of the methods used by other authors and by those wishing a view of this aspect of the school plant field. The uniqueness of the Conrad formula derives from the fact that all program factors are considered in its use.

6. Conrad, M. J., and Smith, Clifford. "School Plant Evaluation Profile." Columbus: The Ohio State University, 1962. (Mimeographed)

This is an instrument based upon educational program elements, for evaluating school buildings.

7. George, N. L. "How to Evaluate Quality," American School Board Journal, 138:29-31, January 1959.

The major elements in school plant planning and construction necessary for quality determination include: adequate long-range educational planning, appropriate facilities, architectural creation of planning, choice of basic building materials and the process of construction, craftsmanship of the builders, materials durability and adaption to local climate conditions, and attractiveness. A two-page checklist of quality levels is included.

8. Landes, Jack L., and Sumption, Merle R. Citizens' Workbook for Evaluating School Buildings. New York: Harper and Brothers, 1957.

This manual is, in fact, a workbook for citizens who wish to appraise their school buildings in terms of how well they fulfill the housing needs of education in the community. The essential directions for scoring are provided and questions on each characteristic are set forth and accompanied by suggested criteria for rating.

9. McGuffey, Carroll W. MEEB: Model for the Evaluation of Educational Buildings. Chicago: Simu-School Center for Urban Education Planning, 1974.

This monograph describes conceptual and practical aspects of a comprehensive and systematic approach to the facility evaluation process. The system includes quantitative and qualitative aspects for measuring the adequacy of the environmental factors which affect the functioning of facilities in support of the educational program.

10. School plant chapter of typical survey reports. The Ohio State University, College of Education, Educational Administration Faculty.

E. Financial Considerations.

1. Guide for Planning Educational Facilities, Chapter 13, pp. 34-36.

2. Creative Planning of Educational Facilities, pp. 23-24, pp. 163-171.

3. Planning Educational Facilities, Chapter 5.

4. Schools for America, Chapters 16 and 17.

5. Furno, Orlando R. "The Cost of Borrowing Money," School Management, 8:89-91, July 1964.

Interest rates paid to borrow money for schoolhouse construction vary widely from district to district. Factors affecting this difference are: 1) the credit rating of the district, 2) the state of the bond market as a whole, 3) the time required to repay the loan, 4) the amount to be borrowed, and 5) the time at which the money is borrowed. The author suggests that the factor a school district can control best is the credit rating (as represented by the "Moody rating") earned by the school district. A chart explaining Moody ratings is included.

6. McCann, Lloyd E. "On the Indebtedness of School Districts," American School Board Journal, 147:9-10, September 1963.

The author discusses three methods by which school districts may escape debt limitations in meeting the demands of school building construction. These three methods are seen as the "pay-as-you-use" or lease-purchase plan, the use of tax anticipating instruments, and the "pay-as-you-go-plan." While the author describes these three possibilities, he cautions that, "eventually the economic costs of providing schools have to be paid" and states that the present pattern of debt limitations may require school districts to pay premium prices for what they get.

7. Morphet, Edgar L., and Corbally, John E., Jr., "How Shall We Finance New School Buildings?" American School and University, Vol. 1, 1956-57, pp. 173-182.

"The problem of financing new school buildings in this country has not yet been solved satisfactorily in many areas, but it can be solved if the American people cooperate in agreeing on a desirable program and inputting it into operation without any more unnecessary delays." The authors delineate general and financial considerations recognized as highly desirable by many authorities in the field and describe present state provisions.

8. Piele, Philip K., and Hall, John S. Budgets, Bonds, and Ballots. Lexington, Massachusetts: D. C. Heath, 1973.

The book summarizes and analyzes research on voting in school financial elections. The book focuses upon the problem of declining support for school financial issues, participation in school financial elections, determinants of voter behavior and election outcomes. Emphasizes need for thorough building needs studies prior to financial elections for new buildings.

9. Stollar, Dewey, "How to Market Bond Issues," The Nation's Schools, 74:50-1, November 1964.

The first of two articles on school bond issues, this essay treats what to include and exclude from the bond sale notice.

10. Stollars, Dewey H. "Selected Factors Affecting Marketability of School Bonds in Ohio." Unpublished Ph.D. dissertation, The Ohio State University, 1963.

    The author has identified factors which affect the successful sale of marketability of school bonds. For Ohio, he has also identified hindrances to successful bond sales. He concludes that there are means of improving bond marketing in Ohio and offers suggestions for improving the technical skills of school administrators and the relationships involved in the sale of school bonds.

11. Wilkerson, Bill. "Financing Facilities," CEFP Journal 12:4 (August, 1974), 16-17.

    The author discusses the impact of two major forces shaping the trends in financing educational facilities: the rise in construction costs and the search for equity in tax burden and educational opportunity. Consequences of these pressures are assessed for future impact.

12. Finance chapter of typical survey reports, The Ohio State University, College of Education, Educational Administration Faculty.

13. See state laws pertaining to state capital assistance plans and U.S. Public Law 815.

F. Recommendations.

1. Guide for Planning Educational Facilities, pp. 36.

2. Creative Planning of Educational Facilities, pp. 42-45.

3. Planning Educational Facilities, pp. 28-33.

4. Griffith, William J. "Consider Total School Housing Plan," The American School Board Journal. 152:10-11, June 1966.

   The author conceptualizes the process of school planning as a cone shaped model in which the altitude of the cone represents time and the other dimensions represent change in enrollment and program. The apex of the cone represents the present in terms of pupil population, educational program, and time. The base represents the long-range plan. The slant height of the cone is dotted for a portion of its length to indicate that the time for the long-range plan cannot be fixed. Other aspects of the model represent the short-range plan and the immediate action plan.

5. Recommendations section of typical survey reports, The Ohio State University, College of Education, Educational Administration Faculty.

PART VI: OPERATIONAL FACILITY PLANNING -- PLANNING AN INDIVIDUAL BUILDING

A. The Planning Process.

1. Guide for Planning Educational Facilities, pp. 144-145.

2. Creative Planning of Educational Facilities, pp. 142-147.

3. From School Program to School Plant, Chapter 6.

4. Caudill, Rowlett and Scott. Computer Aided Campus Planning for Colleges and Universities. New York: Educational Facilities Laboratories, Inc., 1967.

   Report of research study aimed at developing computer based planning system at Duke University.

5. Engelhardt, N. L., Jr. "Time Required to Plan and Construct A School Building." American School Board Journal, 150:25-6 January 1965.

   This article provides a listing of the stages of planning and construction as they affect the time of completion of a school building.

6. Gilliland, J. W. and Roaden, O. P. "Life Begins at Forty For Buildings." American School and University, 37:21-3, August 1965.

   A delineation of the role of educational planning and specifications in relation to modernization of existing plants and how the school personnel of Louisville implemented this process.

7. Lyman, William, "Taking the Mystery Out of Educational Specifications Writing," American School Board Journal, 145:25-26, September 1962.

   "A set of educational specifications for a new school is basically a detailed description of all the activities that will take place in the building." Other items to be included are the educational philosophy and objectives, the desired general architectural characteristics, and a preliminary budget covering building construction equipment and furniture, site development and fees. The author presents a questionnaire to be used by school boards when writing educational specifications.

8. Parker, Floyd G., and Featherstone, Richard L. "How to Specify Educational Needs School." The Nation's Schools, 73:49-54, January 1964.

   An effective set of educational specifications will tell the architect what he needs to know about the educational program -- present and future -- which will be housed in the structure he has been hired to design. This article lists what these specifications should include, how to collect facts on which to base these specifications, what questions to ask to determine specific facility and equipment requirements of the school program, and how to finally produce the specifications.

9. Salisbury, Arnold, and Wilber, A. M. "Build a Better Schoolhouse Today for Tomorrow's Needs," Ohio School Board Journal, 16:2 (February, 1972), 14-15.

   The thesis of the article is that in the past school districts have constructed many fine buildings but few good schools, and the remedy for this situation is more extensive development of educational specifications. Cooperative working relationships between educator and architect are emphasized.

10. "School Planners Agree on Need for Educational Specs," Nation's Schools, 83:99, May 1969.

    This is a report of a survey of administrators concerning educational specifications. It indicates that the need for writing educational specifications is generally accepted. It is also interesting that more than one-fourth of the administrators surveyed reported their districts did not produce ed specs.

11. Strevell, Wallace H. (ed.) Preconstruction Planning For Educational Facilities. Chicago: Association of School Business Officials, 1972.

    A series of 17 articles covering most of the planning process for new school facilities. Topics include: selection of furniture and equipment, security mandates in school planning, computing school plant capacity, financial constraints, systems approaches, and staff structures for planning.

12. Wohlers, A. E. "A Manual for Planning a Secondary School Building." Pamphlet A-1 Columbus: Educational Administration and Facilities Unit, The Ohio State University, 1954.

    In the cited work, the section entitled "Purpose of the Manual" gives the reader a brief but comprehensive statement of the process involved in planning school buildings and indicates the personnel who should be involved in such planning. Descriptions and titles of the other pamphlets in the series are included.

    This manual is in the process of being re-developed by Ross Hodel, Educational Administration Faculty, The Ohio State University.

B. Establish Details of Program.

1. From School Program to School Plant, Chapters 6 and 11.

2. Planning America's School Buildings, Chapters 3, 4 and 5.

3. Educational Administration and Facilities Unit, The Ohio State University, A Manual for Planning an Elementary School Building. (Mimeographed)

A manual following the format of those developed by A. E. Wohlers which is designed to assist teachers and other personnel involved in the planning of an elementary school building. This manual helps teachers and other personnel to collect and correlate their thoughts, ideas, and desires and to state them in terms which will be of use to an architect in drawing working plans and specifications for the desired building.

4. Holmes, G. W. "Plan the School for the Program," School Executive, 73:19-21, March 1954.

   If a school building is to do more than provide seating and shelter for children, if it is to be an educational tool, it must be planned and designed accordingly. Classroom design to a great extent shapes the program of education offered in a community. The author urges careful and thorough educational planning in school districts where a building program is in progress.

5. Knezevich, S. J. "Curriculum and the School Plant," Educational Leadership, 10:495-503, May 1953.

   The school plant, this author suggests, is "the physical expression of the educational philosophy of the community." Building a more functional school plant necessitates more active participation on the part of curriculum workers during school plant planning periods.

6. Propst, R. High School: The Process and the Place. New York: Educational Facilities Laboratories, January 1972.

   The schoolhouse is a building, but the schoolhouse also has a "feeling" which it conveys to the occupant. This report studies the "feeling" of the schoolhouse and the various possibilities for new designs to enhance emotional impact. The report is divided into three sections: (1) the school facility--what is it? (2) a setting for living and learning (3) implementation.

7. Ward, Richard F. and Kurz, Theodore E. The Commuting Student. Detroit: Wayne State University, 1969.

   Reports a study of problems and needs of the commuting student at one institution with recommended solutions.

8. Wohlers, A. E. "A Manual for Planning a Secondary School Building," Columbus: Educational Administration and Facilities Unit, The Ohio State University, 1954 (Mimeographed)

   The 23 series manual is designed to help teachers and other planning personnel establish the details of their program for plant planning purposes.

9. Additional entries concerning program may be found in Part V, Section B, Tactical Facility Planning--District-wide Building Survey, "The Educational Program."

C. Calculate Room Needs.

1. Creative Planning of Educational Facilities, pp. 353.

2. From School Program to School Plant, pp. 112-126 and pp. 276-375.

3. Bareither, Harlan D. and Schillinger, Jerry L. University Space Planning: Translating the Educational Program of a University Into Physical Facility Requirements. Urbana, Illinois: University of Illinois Press, 1968.

   Presents a precise method to derive quantity of facilities required for a defined academic program for a given student population.

4. Conrad, M. J., A Manual for Determining the Operating Capacity of Secondary School Buildings. Columbus: Educational Administration and Facilities Unit. The Ohio State University, 1954.

   This manual has been developed to enable the school administrator to determine the operating capacity of a building in terms of the specific educational program and policies of the school district.

5. _____. "A Technique for Determining the Operating Capacity of Secondary School Buildings." Unpublished Ph.D. dissertation, The Ohio State University, pp. 158-162.

   This dissertation describes the development and application of the techniques presented in the manual listed above.

6. Holy, T. C., and Herrick, John H. "School Plant," Encyclopedia of Educational Research. Revised edition. Edited by Walter S. Monroe. New York: MacMillan Company 1950, pp. 1099-1103.

   This article covers 15 aspects of school plant, the section concerning techniques for determining housing requirements for the elementary school and an outline of three major studies (those by Anderson, Packer, and Wilson) dealing with methods for determining the housing requirements for a given secondary school educational program.

7. Richardson, Gordon E. "Computing School Plant Capacity," Preconstruction Planning for Educational Facilities. W. H. Strevell (ed.) Chicago: Association of School Business Officials, 1972.

   A method of computing capacity of existing facilities based upon student station and teacher station utilization is presented. The work is based upon that of Basil Castaldi and presents a shortened and simplified discussion of utilization and capacity.

8. Wohlers, A. E. "A Manual for Planning a Secondary School Building." Pamphlets B-1 and B-2. Columbus: Educational Administration and Facilities Unit, The Ohio State University, 1954. (Mimeographed).

   These manuals are part of a series of manuals designed to aid in the planning of a secondary school building.

D. Develop Specifications for Specific Areas

1. General References

   a. Guide for Planning Educational Facilities, pp. 69-110.

   b. From School Program to School Plant, Chapters 14-18.

   c. Planning America's School Buildings, Chapters 3, 4, and 5.

   d. Educational Administration and Facilities Unit, The Ohio State University. "A Manual for Planning an Elementary School Building." (Mimeographed)

   e. Wohlers, A. E. "A Manual for Planning a Secondary School Building." Columbus: Educational Administration and Facilities Unit, The Ohio State University, 1954. (Mimeographed)

      The entire manual consists of 23 pamphlets. Pamphlets A-1, B-1, B-2, and C-1 are explanatory and provide directions for use of the others. Pamphlets C-2 through C-19 provide materials in the various subject and building service areas which assist the school staff in planning for the facilities desired in a new school plant.

   f. Typical educational specifications for new schools, The Ohio State University, College of Education, Educational Administration Faculty.

2. Basic Classroom Areas.

   a. From School Program to School Plant, Chapter 13.

   b. Planning America's School Buildings, Chapters 3, 4, and 5.

   c. Harms, Thelma. "Evaluating Settings for Learning." Young Children, 15 (May, 1970), 304-6.

      This article discusses the impact of the physical environment of the classroom upon the behavior of children in that classroom. The environment, the quality and arrangement of space, is a powerful means of communication. Communication which at times can interfere with the purposes of the classroom. The author notes implications for open space schools. A checklist is provided for evaluating physical environment.

   d. Harris, J. W., Editor, "Getting Away From the Rectangular Classrooms," School Management, 4:60-66, July 1960.

The rectangular classroom is not necessarily the best shape for classrooms. In fact, it may be a deterrent for some kinds of activities. It has been suggested that we think in terms of differently shaped rooms for different forms of learning.

e. Hurt, N. J. "How to Keep Kids From Getting Lost in the Open School," Phi Delta Kappan, LVI:5 (January, 1975), 345-349.

The author describes the typical open space as "a huge room where 25 similar screens separate the many student groups." Large open spaces have become akin to students because these spaces are more geared to "packing students in" rather than recognizing student needs. Educational spaces need (1) differentiation of scale, (2) a sense of turf, (3) a focal point, (4) differentiation of mood, (5) directionality, (6) furnishings and equipment. These needs are discussed and graphic illustrations given in a sound article which relates open space to children's needs.

f. MacConnell, James D., and Ovard, Glen F. "On Planning Academic Classrooms," American School Board Journal, 144:34-38, February 1962.

This article outlines general procedures for planning academic classrooms and points out that it is vital that these facilities be planned according to the functions that are to be performed in them. The authors discuss who should do the planning and identify the techniques of good planning.

g. National Council on Schoolhouse Construction. Elementary School Plant Planning. Nashville: Special Committee on Elementary School Plant, 1958.

This pamphlet is a thorough and comprehensive treatment of the factors which are to be treated in planning an elementary school plant. The two-page list of references for elementary school planners included at the end is a good source of materials which were published prior to the 1958 publication date of this work.

h. _____. Secondary School Plant Planning. Nashville: The Council, 1957, pp. 22-51.

This pamphlet is a thorough and comprehensive treatment of the factors which are to be treated in planning a secondary school plant. The two-page list of references for secondary school planners included at the end is a good source of materials which were published prior to the 1957 publication date of this work.

i. Osmon, Fred. Patterns for Designing Children's Centers. New York: Educational Facilities Laboratories, 1971.

The book offers a rationale for all the facets of a children's center and what is really needed in one. It provides no standard or universal answers but discusses how the young learn and how adults may constructively respond. A good summary of the issues involved in designing children's centers.

j. Ovard, Glen F. "It's Time to Plan Academic Classrooms," American School Board Journal, 144:26-27, January 1962.

The first in a series of articles on planning classrooms for the academic areas of the modern secondary school. The author cites five reasons for the necessity for adequate planning in academic areas. These are: academic subjects are the basic framework for the existence of schools, demands of present world problems for topics engendered in the academic areas, that reducing the effectiveness of the basic educational program is false economy, the physical facilities of a classroom should aid in carrying out teaching and learning activities, and teachers are trained to use new findings in psychology and technology - one must facilitate use of this training.

k. Schroeder, W. E. "Environment: Classroom Set Up For Learning, A Better Use of the World Beyond," Grade Teacher, 87 (January, 1970), 109-113.

Arguing that the environment influences the learning process, the author focuses on four central ideas: (1) the classroom should be non-uniform, (2) the classroom should be manipulatable, (3) the environment should be engaging, (4) the environment should be informative. This article presents an architect's view of classroom environment.

l. Typical educational specifications report, The Ohio State University, College of Education, Educational Administration Faculty.

3. Art.

a. "Art Rooms and Equipment," Bulletin of the National Association of Secondary School Principals, 45:62-81, March, 1961.

The authors here offer a discussion of some of the basic physical requirements for an adequate art program. Included is a discussion of educational specifications, equipment, and trend in planning for art rooms.

b. Martin, K. "The Arts, the Schools, and the Community-wide Resource Center," Phi Delta Kappan, LVI:5 (January, 1975) 334-7.

The article describes the Roberson Center for the Arts and Services at Binghampton, New York, and its USOE project to bring the arts in their many forms to the schools. The project provided for live theatre, ballet, opera, symphony among others to be brought to the students.

c. National Art Education Association. "Essentials of a Quality School Arts Program," Art Education, XXVI (April, 1971), 21-26.

The position paper of the Association on art programs. The paper lists the objectives of an effective art program and details experiences that will aid in meeting those objectives. Recommendations for program guidelines include: (1) lower student-teacher ratios and additional space, (2) special art rooms for elementary schools, (3) new materials and equipment, (4) the inclusion of photography, still and motion, and T.V. in the art program.

d. Taylor, James L., and Others. Space and Facilities for Art Instruction. U. S. Department of Health, Education and Welfare, Office of Education, Special Publication No. 9, Washington, D. C., U. S. Government Printing Office, 1963.

This is a report of a study in which an attempt was made to identify trends in new and remolded facilities for art instruction, and to secure pertinent information on new art facilities and suggestions for use in planning these facilities. Illustrations, photographs, and floor plans are used to show the reader some of the current ideas for art facilities layout.

e. Timmons, V. G. "Organizing for Art," School Arts, 70 (February, 1971), 12-13.

The article gives practical organizational tips for designing an art room. Suggestions make use of common objects which allow art room organization at a minimal expense. The author focuses upon the need for visual organization and organization of work, storage, and display areas.

4. Administration and Guidance.

a. Dykstra, Charles T. "Here's Design Guidance for a Counseling Suite," Nation's Schools, 91:6 (June, 1973), 50-51.

A counselor describes how he converted found space into a counseling suite for two counselors and a secretary. Included is a floor plan.

b. Taylor, James L. "Administrative Facilities in School Buildings," U. S. Department of Health, Education and Welfare, Office of Education, Special Publication No. 6, Washington, D. C.: U. S. Government Printing Office, 1957.

This brochure emphasizes the importance of studying and analyzing administrative functions and activities when planning facilities. Some characteristics of various elements are described and a number of floor plan layouts of administrative facilities are provided. A short annotated bibliography is included.

c. "Why Toronto Put a 'Professional Center' In Its Business Office," The Nation's Schools. 69:70-74, January 1962.

"The headquarters building of a school system should do more than provide centralized offices for its administrative and business departments." Toronto, Ontario, has accomplished this by making their central facility a place where the public can look for intelligent and informed educational leadership. In this building are facilities which offer the teaching staff opportunity for study, inquiry, research, training, and professional growth. Some of these facilities are: a professional library; an auditorium/conference room (capacity, 250); reception, committee and waiting rooms; a sound proof studio equipped for radio, television and motion picture production; a reading clinic, and a research department.

5. Auditorium and Stage.

a. Bowman, Ned A., Coleman, William, and Engel, Glorianne. Planning for the Theatre. Pittsburgh: Department of Speech and Theatre Arts, University of Pittsburgh, 1965.

This publication should be of great help in the planning of a theatre of similar space. It contains a detailed checklist concerning theatres. Each item on the checklist is keyed to the excellent bibliography. Thus indicating a specific source containing further information on that item.

b. Brown, R. H. "Maximum Use Planned for New Auditorium," American School Board Journal, 154:54-55, February 1967.

When it became apparent that the new high school was deficient because no auditorium facilities had been provided, school officials set about to design a structure which would be used by a widely diversified selection of groups on regular basis.

c. Educational Facilities Laboratories. Divisible Auditorium, New York: The Laboratories, 1966.

This booklet illustrates numerous approaches to dividing the auditorium for instructional purposes and treats some of the problems connected with dividing such a space.

d. Educational Facilities Laboratories. New Building on Campus: Six Designs for a College Communications Center. New York: TLC Laboratories, 1963.

Presents six solutions to a design problem at Rensselaer Polytechnic Institute -- implications for similar facilities elsewhere.

e. Educational Facilities Laboratories. The High School Auditorium, New York: The Laboratories, 1967.

This pamphlet is concerned with both new and remodeled auditoriums. Acoustics, stage, and audio-visual needs are given detailed consideration. Included are illustrations and examples.

f. Hutchinson, George. "Planning and Designing a University Theatre," College and University Business, 56:2 (February, 1974), 41-43.

To "set the stage" it is important to identify the cast of characters, in addition to the architect, who play important parts in the creation of an educational theatre. Planning and designing a university theater requires a multiplicity of talents and experiences which must be marshaled and coordinated. Although a slight emphasis on architectural design is presented, other roles in planning are discussed.

g. Iron, William A. "The High School Multi-Purpose Theatre: A Critical Study," Curriculum Bulletin 17, Eugene: School of Education, University of Oregon, 1961.

This study combines information about the particular requirements of the theatre and the problems of the multi-purpose combination which affect multi-use design. A multi-purpose area for drama is a second choice when compared with a non-classroom area which includes the gamut of facilities vital to dramatic performance. However, with proper planning multi-use facilities can be made acceptable.

h. Miller, James Hull, and Kula, R. H., "The School Auditorium," School Activities, 40:4-13, May 1969.

This article gives a very thorough picture of the diversity as well as the complexity existing in school auditoriums. The most valued aspect of this section, however, is the excellent illustrations.

6. Cafeterias and Kitchens.

a. Davis, Clifford M. "Individual Kitchens vs. Central Kitchens for School Use." American School and University, 1:207-210, 1957-58.

Mr. Davis advances pro and con arguments for individual kitchens as opposed to central kitchen operation. His bias shows through in this article, however, since a stronger case is made against the central kitchen operation than for it.

b. U. S. Department of Agriculture, Agriculture Marketing Service. A Guide for Planning and Equipping School Lunchrooms, P.A. 292. Washington, D. C.: U. S. Government Printing Office, 1956.

Adequate facilities are essential to the operation of a good school lunch program. This booklet provides information on location, space, construction features, and equipment for all lunch room areas. General guides, based on meal loads ranging from 100 to 750 lunches per day, are provided. These guides can be adapted to specific local situations and needs.

c. Willet, Roslyn. "Food Service Problems and Possibilities," College Management, 8:3 (February, 1973), 16-17.

Before installing a new food service facility or revamping an old one, stop and consider the opportunities and pitfalls of today's trends. A good discussion of new preparation systems, alternatives and problems to be considered prior to planning a food service facility.

7. Foreign Language.

a. Crossman, David M. "The Acquisition of a Language Laboratory; Circa, 1966," Audiovisual Instruction, 11:632-636, March 1967.

This article discussed the development and success of language laboratories. Included are an excellent set of guidelines for purchasing, installing, and maintaining a language lab. The same volume of this journal contains other articles relating to language labs.

b. Hutchinson, Joseph C. Modern Foreign Languages in High School: The Language Laboratory, U. S. Department of Health, Education, and Welfare, Office of Education, Bulletin No. 23. Washington, D. C.: U. S. Government Printing Office, 1961.

The installation of a language laboratory must be preceded by a re-appraisal of the school's foreign language program. Such facilities contribute most when audio-lingual instruction forms the basis for the progressive and continuous development of all the language skills. This bulletin discusses how one may plan and prepare for the use of such facilities.

c. Johnson, Marjorie. "How to Plan a Language Laboratory," The Nation's Schools, 63:102-106, February 1959.

This article discusses the need for the language laboratory, the use of the language laboratory, supervision in the language laboratory, and the educational values attained through the use of the language laboratory. Pictures of some existing varieties of laboratories and a schematic plan for an ideal laboratory are included.

d. "Language Labs: An Agonizing Reappraisal," Overview, 1:45-49, November 1960.

The language lab story is an involved one, and bears every sign of becoming more so. It is time to get an overview of the language lab situation. Since "language lab" is a misnomer for what is in reality an electronic learning lab, new ways of looking at its use must be devised in order to preserve a useful teaching device from the apathy of educators and the discouragement of producers.

e. Martland, Theodore H. "Have You Considered Multi-Purpose Language Labs?", School Management, 5:86-90, March 1961.

Since most students can't profitably spend more than 20 minutes of each class hour doing intensive lab drills, some other uses must be made of these spaces other than electronic teaching. The faculty of one school in Valley Stream, New York, report their solution to this dilemma.

8. Health, Physical Education and Recreation.

a. "Athletic and Play Areas," American School Board Journal, 150:25-64, February 1965.

This citation is a collection of articles and advertisements which is in fact a separate "Bookazine" dealing with athletic and play areas. Articles appearing in this section are:

(1) "Playground Aestheticism Part of American Heritage." George T. Wilson
(2) "Designer - Consider Community Needs." Fred Dirhel
(3) "Here's Exemplary Athletic Setup." Robert Tank and Milton Blake
(4) "Hard Turf Problems Softened." Harry Wilcox
(5) "Pavements - Past, Present and Future." K. N. Cundall
(6) "What is Legally Adequate Playground Supervision?" M. Chester Nolte
(7) "All The Girls Ask Is Space...To Enjoy Their Sports." Nancy Poe
(8) "Determined Music Teacher 'Composes' Physical Education Symphony" Janetta Girotto
(9) "Ventilation Guide to Good Environment." Kenneth Beseke
(10) "Fundamentals in Selecting Gym Seating." Cecil Ishall
(11) "Daylight Saving Some Costly Light Problems."
(12) "New Products in the Field."

b. Bronzan, Robert T. New Concepts in Planning and Funding Athletic, Physical Education and Recreation Facilities. St. Paul, Minnesota: Phoenix Intermedia, Inc., 1974.

Changes in program requirements in physical education have been brought about by earlier retirement ages, longer lifespans, occupations which require minimal physical effort, greater amounts of leisure time, and more active participation of women in sports and recreation. The book focuses attention to the development of programs which satisfy the demands of these new changes and needs. The interrelationship of program and facilities is stressed.

c. Educational Facilities Laboratories, Air Structures for School Sports. New York: The Laboratories, 1964.

The nylon "bubble" may provide the answer for enclosing large areas quickly and cheaply. Answers to many questions which arise when one considers air-supported structures are found in this EFL report.

d. Hausai, R. F. "Playgrounds Designed for Adventure," Journal of Health, Physical Education and Recreation, 40 (May, 1969), 34-36.

The asphalt playground with assorted metal apparatus such as monkey bars and slides is inadequate for the needs of children. The article suggests the use of trees, forts, and old boats -- materials which will allow for exploration and creativity. Well designed playgrounds by themselves are not the answer. Good leadership is also needed.

e. Kelsey, F. L. "Sports Facilities: The New Breed," Phi Delta Kappan, LVI:5 (January, 1975), 321-25.

The pressures of new demands for girls' sports, lifetime sports, intramural sports, community use have brought about new designs in sports facilities. The author, an architect who designed Durango High School, cites 11 principles for sports facilities: (1) share things: use the school as a community facility, (2) share things: use the community as a school facility, (3) share things: divide the cost of indoor facilities, (4) use outdoor facilities after dark, (5) design a flexible, open gymnasium, (6) get some action from the vertical surfaces, (7) use the floor...really use it, (8) put room dividers to work, (9) try some "swinging" locker rooms, (10) specialized facilities for women, (11) storage for the girls' program.

f. Passantino, E. D. "Adventure Playgrounds for Learning and Socialization," Phi Delta Kappan, LVI:5 (January, 1975), 329-33.

The article argues for a rethinking of our approach to playgrounds for children. Arguing that the absence of meaningful playground space may be a cause of vandalism, the author recommends the building of playgrounds which allow children to create and to explore. Examples mentioned are "junk-yard" playgrounds and a number of exploring playgrounds built in Europe. The concept of a professional play leader is also discussed.

g. Robertson, D. J. "Pools in Schools," National Educational Association Journal, 56:41, May 1967.

"Square foot to square foot, hour to hour, and year to year, no physical education facility can be more fully used than the swimming pool." The author points out eight components of an excellent school swimming and water safety program.

h. National Conference on Areas and Facilities for Health, Physical Education and Recreation. Planning Areas and Facilities for Health, Physical Education and Recreation. Bloomington, Indiana, Indiana University, 1965, Rev. Ed.

The expanding availability of leisure time and the concern over the growth of "spectatoritis" leads one to conclude that more attention should be paid to the areas of health, physical education and recreation. Facilities for a wide range of activities must be provided in today's schools. This conference report indicates some of the pertinent concerns in this area and how to plan facilities to provide for them.

i. The Athletic Institute, Inc. Planning Facilities for Health, Physical Education and Recreation. Chicago: The Institute, Rev. ed. 1965.

This revised guide provides concrete information and practical suggestions of material value to planners of facilities for athletics, recreation, outdoor education, and physical and health education. It includes many diagrams and sketches showing specific measurements of these areas and facilities and provides a checklist for construction jobs. Its glossary can prove valuable to the planner as an aid to understanding the dialogue of the program specialist.

9. Home Economics.

a. Ericksen, C. Aileen. "Adding Variety to Homemaking Programs," American School and University, 1961-62, pp. 9-18.

Homemaking education facilities should be functionally organized into a number of centers. These centers should be so arranged and planned as to enhance the teaching of various program units. Some of these units are: 1) care and guidance of children; 2) personal and social development; 3) money and time management; 4) selection, care, management, and furnishing of the home; 5) selection, purchasing, preparation, serving, conservation, and storage of food; 6) selection, purchasing, care, renovation, and construction of clothing; and 7) family health and safety. Other considerations discussed are: location, the electrical system to be provided, and specific equipment needed.

b. Division of Vocational Home Economics. Space and Equipment for Dual Role Consumer and Homemaking Facilities. Columbus, Ohio: The State Department of Education, 1975.

This bulletin provides information for school planners of home economics departments concerning the various factors to be considered in such planning. Sections of this work are devoted to: underlying principles, location and arrangement of space, general features of activity or work centers in the department, storage, equipment and furniture, and auxiliary features.

c. Meckley, Richard, Valentine, Ivan E., and Conrad, M. J. A Guide For Planning Facilities for Home Economics Occupational Preparation Programs. Columbus, Ohio: Center for Vocational and Technical Education, 1968.

A guide for planning facilities for occupational programs in home economics to be used in the preparation of educational specifications. The guide lists a series of pivotal questions about the educational program. The guide also provides for the description of instructional areas needed to meet program requirements. Much of the material is presented in a checklist format which allows for consideration of alternatives in facility planning.

d. Taylor, James L. and Johnnie Christian. Planning Functional Facilities for Home Economics Education, U.S.O.E. (Special Publication #12). Washington, D. C.: U. S. Government Printing Office, 1965.

In planning facilities for the home economics department, one should consider carefully the activities to be carried on in them. This special publication is a good source book for ideas and suggestions which will be of help in planning home economics facilities.

10. Industrial Arts.

a. American Council on Industrial Arts Teacher Education. Planning Industrial Arts Facilities. Eighth Yearbook. Ralph K. Nair, Editor. Bloomington, Illinois: McKnight and McKnight Publishing Corporation, 1959.

This yearbook presents principles and procedures for planning new facilities or altering laboratories now used for industrial arts activities. Early chapters explicate philosophies on which industrial arts teaching is based. Later chapters provide specific details concerning laboratory planning, equipment selection, planning procedures, and evaluation of facilities.

See also chapters related to facility planning and design in:

Twenty-first Yearbook, Industrial Arts for the Early Adolescent. D. L. Householder, editor, 1971.

Twenty-second Yearbook, Industrial Arts in Senior High Schools. R. E. Lockette, 1972.

Twenty-third Yearbook, Industrial Arts for the Elementary School. R. G. Thrower, and R. D. Weber, Editors, 1974.

b. Chase, William W., Johnny W. Browne, and Michael Rosso. Basic Planning Guide for Vocational and Technical Education Facilities. Washington, D. C.: U. S. Office of Education, 1965.

This booklet presents those aspects of the Vocational Education Act of 1963 which pertain to construction of area vocational schools and deal with the basic principles involved in planning such facilities.

c. Educational Facilities Laboratories. Career Education Facilities. New York: The Laboratories, 1973.

A programming guide for shared facilities that make one set of spaces or equipment serve several purposes. Suggestions for planning and guidelines for the development of facilities and educational programs for occupational education are presented.

d. Nerden, Joseph T. Vocational Technical Facilities for Secondary Schools. Columbus, Ohio: Council of Educational Facility Planners, 1970.

A comprehensive document covering all areas of concern in planning vocational-technical shops and laboratories. Discussion of programs, planning considerations, support facilities, design and usefulness, and shops and laboratory units are included. Other important topics included are student interest surveys, industrial surveys, parent interest surveys, and vocational guidance and counseling.

e. Ohio Industrial Arts Association. A Guide for Industrial Arts In Ohio Schools. Columbus: Ohio Department of Education, 1960.

Industrial arts offerings no longer are limited to woodwork and mechanical drawing but must provide for subject areas more nearly representative of the vast technology of our ever expanding industrial environment. This guide outlines a program which is broadly conceived to teach aspects of industry as a part of the education of all youth.

f. Risher, C. E. "Picking and Buying Industrial Lab Equipment," Industrial Arts and Vocational Education, 60:9 (December, 1971), 10-13.

The author emphasizes three parameters in determining the quantity and quality of tools and equipment for industrial laboratories. (1) Course objectives or behavioral proficiencies are the primary consideration; (2) safety considerations are the second priority; (3) Instructional organization is the final area for consideration in purchase.

11. Learning Resources Center or Library.

a. Darling, R. L. "Changing Concepts in Library Design." American School and University, 37:98-100, May 1965.

Presented here are some new ideas about libraries which maximize functionality. Areas which should be included in modern libraries are: small work spaces, listening centers, reading rooms, and discussion rooms.

b. Ellsworth, Ralph E., and Wagener, Hobart D. The School Library: Facilities for Independent Study in the Secondary School. New York: Educational Facilities Laboratories, 1963.

The frame of reference for this report is the contradiction found in the schools of America in which educators stress the value of independent study yet in which the paucity of libraries constitutes a professional disgrace. In this report are offered recommendations for the design of secondary school libraries meant for individual use.

c. Glogan, L., et. al. Developing A Successful Elementary School Media Center. Parker Publishing, 1972.

A complete text which offers a three-phase plan for organizing, equipping, and implementing a learning center. The book contains floor plans and descriptions of new learning centers, suggestions for remodeling present structures, scheduling approaches for the learning center and techniques for making the learning center an integral part of the school program.

d. Hodges, Elizabeth. "Physical Requirements for Good Library Service," American School and University, 1961-62, pp. 11-16.

The school library should be planned to contribute effectively to the school's educational program as it presently exists and as it is projected by the administration and staff. In order to accomplish this, cooperative planning of library facilities is imperative. In this article a number of features to be considered through this cooperative approach are presented. Pictures and drawings of selected libraries are included.

e. Hostrop, R. W. Education Inside the Library-Media Center, Shoe String Press, Mamden, Connecticut, 1973.

This book concentrates on what happens inside the learning center once it is functioning. Hostrop argues for the efficacy of media as a learning instrument and sees the role of teacher as becoming that of manager, supervisor, and counselor of learning situations. Incorporating media and the learning center into classwork will make learning more efficient, more individual, and more scientific.

f. Ironside, Ivan C. "The Modern Instructional Materials Center," American School Board Journal, 145:19-21, August, 1962.

The concept of an instructional materials center visualizes a location within a school where all necessary materials for student or teacher research are gathered. Not only printed matter should be provided, but all other materials, equipment, and supplies. The author describes how this is provided in one high school.

g. Jarvis, O. T., and Pounds, H. R. "Developing a Library Materials Center," Organizing, Supervising, and Administering the Elementary School.

A textbook overview of the concerns inherent in developing a library materials center. The chapter approaches the materials center from the point of view of the principal and includes equipment, design, and staffing considerations. Purposes and principles of a library program are listed as derived from the objectives of the American Library Association.

h. Kay, J. H. "Ideals and Axioms," American Library, May, 1974.

The author is critical of contemporary architects in their treatment of school libraries because of their inability to fulfill both functional and aesthetic requirements. She uses as a positive example the elementary media center of Bancroft School in Andover, Massachusetts, a center which combines "beauty, comfort, and function."

i. Kelley, Gaylen B. "Technological Advances Affecting School Instructional Materials Centers," Audiovisual Instruction, 14:42-48, September 1969.

The author describes what changes in curriculum and technology mean in terms of a materials center. Some of the types of equipment and systems discussed for use in a materials center are very sophisticated and obviously expensive. This article should be helpful in identifying equipment for a materials center providing funds are adequate.

j. Metcalf, Keyes D. Planning Academic and Research Library Buildings. New York: McGraw-Hill Book Company, 1965.

A very comprehensive treatment including factors to be considered in library planning and a description of the planning process.

k. "Pattern of School Library Design; Symposium," Library Journal 90:5453-5483, December 15, 1965.

This article describes five high school and four elementary school libraries which are designed for exceptional use. It suggests ways personnel can improve library design.

12. Music.

a. More, G. A. "Suggestions for Planning High School Music Facilities," American School and University, 1958-59, pp. 235-238.

While the author describes the special design of a separate building for school music, the general principles could be applied to a music suite included as part of the main building. The presentation of suggestions in lists allows for easy use of materials presented.

b. Music Educators National Conference. Music Buildings, Rooms, and Equipment. Chicago: Music Educators National Conference, 1966.

This manual provides guidelines for the music educator, the administrator, the board of education and the architect in designing and constructing new school music facilities or remodeling existing ones. It deals with these facilities at all levels from the elementary school through the university. It is concerned with the location, design and size of the facilities, with the storage and auxiliary space provided, and with the equipment placed in those facilities. It is also concerned with auditorium and music shells. In addition, it contains floor plans and photographs of recently completed music facilities, as well as a bibliography of additional references.

c. Music Educators National Conference. "Standards for Physical Facilities," in The School Music Program. Vienna, Virginia: The Conference, 1974.

A chapter addressing itself to adding and updating the publication done by the Music Educators National Conference in 1966. It deals with music facilities at all levels and some desirable standards for them.

d. Weerts, R. "Build Proper Instrumental Facilities" Music Journal, 30 (February, 1972), 48-49.

The author gives his list of prescriptions for an ideal instrumental music facility.

13. Pre-school Learning Spaces.

a. Abramson, Paul. Schools for Early Childhood. New York: Educational Facilities Laboratories, 1970.

The book focuses upon the planning of pre-school facilities in which "easy" learning can take place, and the development of programs that will stimulate child development. Ten examples of new and remodeled facilities for early childhood education are included.

b. Berson, M. P., and W. W. Chase, "Planning Pre-school Facilities," American Educator, 2:7-11, December 1965.

This article describes various considerations which affect the design and construction of areas for pre-school children. The authors develop a reasonable method for local planning of these facilities and describe requirements for out-of-door as well as in-door facilities and equipment.

c. Kritchevshy, Sybil, Prescott Elizabeth and Walling Lee. Planning Environments for Young Children: Physical Space. Washington, D. C.: National Association for the Educational Young Children, 1969.

In this publication the planning of educational spaces for pre-elementary school age children is described in great detail. Included are numerous illustrations, examples of successful spaces, checklists, and a brief bibliography.

d. Skutch, M. F., and Hamlin, W. G. "Environmental Flexibility for Preschoolers," Phi Delta Kappan, LVI:5 (January, 1975), 326-8.

The article responds to four developments in pre-school education: (1) a renewed interest in individual over program; (2) day-long child care; (3) the need for parent education; and (4) the development of electronic aids to education. These four developments each argue for a flexible and open environment for the pre-school.

14. Reaching Laboratories.

a. Martin, J. E. "Guidelines for Planning Special Reading Facilities," The Reading Teacher, 24 (December, 1970), 203-08.

An ad hoc committee of the International Reading Association presents the guidelines for reading facilities. Responsibility of the school administrator, components of the instructional program and requirements of the facility as indicated. Commentary on staff development, community involvement, collection of data, and reading related activities is also included.

b. Goodman, K. S., and Niles, Olive. Reading: Process and Program. Urbana, Illinois: National Council of Teachers of English, 1970.

Part II of this report considers the framework and necessary conditions for a secondary school reading program. The climate for instruction, physical and affective; some trends; recent technological developments; and modes of school and class organization; all having implications for facility planning.

15. Science.

a. Furgusson, Jeremy. "Ten Ideas to Upgrade School Labs," American School and University, 45:1 (September, 1972), 15-17.

Results of a recent study of secondary schools by the National Science Teachers Association are presented. Trends to open science areas, the explosions in teaching technology, individually-paced integrated programs and new student-staff relationships are discussed. Ten specific ideas for new or remodeled science facilities are suggested.

b. "Raise the Floor When Remodeling Science Labs." Nation's Schools, 90:6 (December, 1972), 24.

A new remodeling idea for simplifying a laboratories mechanical services adopts the concept of a raised floor covering gas, water, electrical and drain lines. Advantages and installations in existence are discussed.

c. Richardson, John S., Editor. School Facilities for Science Instruction. Washington, D. C.: The National Science Teachers Association, 1961.

This publication is the full report of a cooperative study by the National Science Teachers Association and the U. S. Office of Education. This study was undertaken to prepare a comprehensive and authoritative publication on science teaching facilities. The board principles and specific details offered here should be valuable to anyone involved in the planning and construction of such facilities.

d. "Where Science Facilities Are Heading," The Nation's Schools, 72:44-46, December 1963.

This article presents a summarization of a survey report of science facilities. Seventeen suggestions on how to set up new science facilities are presented. The survey shows also 24 ways that science education is changing.

e. Williams, Herbert N. "The Planetarium in Modern Education," American School Board Journal, 141:40, September 1960.

The planetarium in a school serves more than a limited purpose. It promotes intellectual curiosity in mathematics, chemistry, physics, and geography and serves to break down artificial barriers between different branches of scientific knowledge. How the planetarium is used in one school is the topic of this article.

16. Special Education.

a. American Standards Association. Specifications for Making Buildings and Facilities Accessible To, and Usable By, the Physically Handicapped. New York: The National Society for Crippled Children and Adults, 1961.

The most common design and construction of buildings and facilities cause problems for the physically handicapped. These architectural barriers make it very difficult to project the physically handicapped into normal situations of education, recreation, and employment. Here are presented specifications which represent minimum requirements for planning, designing, and constructing buildings to overcome the obstacles described above.

b. Chatelam, Leon, J. "More Accessibility For Handicapped," Rehabilitation Record. Washington, D. C.: The Vocational Rehabilitation Administration, U. S. Department of Health, Education, and Welfare, November-December, 1966.

Since barriers to the handicapped are usually built into buildings by the thoughtlessness of architects, they have become known as "architectural barriers." Various interested groups are now actively working to eliminate these barriers in existing buildings and to have new buildings designed entirely accessible and usable by the handicapped.

c. Geigle, Ralph C., and Zeugner, Lorenzo. "Special Education Center." American School Board Journal, 143:19-20, December 1961.

The authors describe a building designed specifically for handicapped youngsters. This facility includes space for the educable retarded, the trainable, the physically delicate, and the severely physically handicapped. A list of the facilities and special features of the building are included.

d. California State Department of Education. Special Schools For Exceptional Children. Sacramento: The Department, 1973.

An expose of exemplary programs for exceptional children related to educational facilities that make possible the implementation of such programs. Emphasis on facility and program, and the involvement of many resources in the planning process. Includes deaf and hard of hearing, educationally and visually handicapped, multihandicapped, orthopedically handicapped, and trainable mentally retarded programs.

e. Educational Facilities Laboratories. One Out of Ten: School Planning for the Handicapped. New York: The Laboratories, 1974.

A report about the implications of the new laws concerning the handicapped, and alternative methods of educating handicapped children in public schools. School district planning and barrier-free facilities are discussed along

with alternatives ranging from the residential hospital to the everyday classroom.

f. Molloy, L. "The Handicapped Child in the Everyday Classroom," Phi Delta Kappan, LVI:5 (January, 1975), 337-41.

Recent court decisions and research in special education have brought about "mainstreaming" -- the placing of handicapped children in the regular classroom. Molloy explores the implications of mainstreaming for the learning environments. He discusses physically handicapped, deaf, blind, emotionally disturbed, and mentally retarded and cites current examples of "mainstreaming" with each of these classifications. Molloy gives two rules of thumb in planning such a classroom environment: "Never make changes in the school environment which are not comfortable for, and of significant benefit to every child; and (2) always make a simulated environment resemble reality as closely as possible."

17. Speech.

a. Boase, Paul H., and Glancy, Donald R. "Speech Facilities for the Modern Secondary School," American School Board Journal, 144:37-39, 50, June 1962.

A balanced speech program in the modern high school should include a wide range of activities. To house these activities, facilities for teaching the fundamentals of speech, a sound control and listening room, a forensic workshop, a speech correction room, and a little theatre, all fully equipped, should be provided

E. Write Educational Specifications.

1. From School Program to School Plant, pp. 127-130.

2. Planning America's School Buildings, pp. 171-175.

3. Rosenstengle, W. E. "Developing the Educational Specifications for the Secondary School Plant," High School Journal, 40:50-53, November 1956.

This author avers that the development of the general characteristics and the detailed features of the school plant results from the thinking and planning of many people. Among those suggested to be included are: the superintendent of schools, the board of education, an educational consultant, the classroom teachers, the pupils, operation and maintenance personnel, and lay citizens of the community.

4. Sheets, W. R., and Hasteller, R. W. "Organizing for EDSPECS Development," Community and Junior College Journal, 43:7 (April, 1973), 24-5.

A discussion of the process of EDSPECS in developing guidelines for the educational specifications of a particular facility. Common elements of educational specifications noted: (1) to be based on the philosophy of the institution, (2) to be developed around the functions, (3) to be specific in stating functions to be carried out in the areas, spaces, and rooms needed, (4) to establish relationships within spaces or areas. The authors include a strong argument for committee development of ed specs.

5. Willey, David A., and Hanson, Nels W. "Is There Vision In Your Educational Specifications?", American School Board Journal, 146:33-36, June 1963.

   Educational specifications constitute a written communication from the educators to the architect comparable to the blueprints and explanatory data which become the written communication from the architect to the builder. Basic responsibility for their preparation rests on the school superintendent. The authors suggest what these specifications should include and suggest both format and topics for them.

6. Typical educational specifications for new buildings, The Ohio State University, College of Education, Educational Administration Faculty.

F. Review Architectural Plans.

1. From School Program to School Plant, pp. 131-132 and 181-185.

2. Spairo, J. W. "How Can I Decide If a Building Plan Is Good?" American School Board Journal, 144:41-42, May 1962.

   A school board member outlines principles and procedures for school boards to follow in considering school building plans. He points out that evaluation of the plans should be based on what the stated objectives of the school are and on a knowledge of the community.

PART VI: THE ARCHITECT AND HIS WORK

A. The Selection of an Architect.

1. Creative Planning of Educational Facilities, pp. 147-150.

2. Guide for Planning Educational Facilities, pp. 39-42.

3. From School Program to School Plant, pp. 159-166.

4. Altman, Millus N. "Know How to Select an Architect," The American School Board Journal, 154:13-14, January 1967.

This article points out the role of the architect in the planning process. Selection of the architect is also described in some detail.

5. American Institute of Architect. "Selecting an Architect for School Building Construction," School Plant Studies, BTI-37. Washington, D. C.: American Institute of Architects.

   A great many things must be considered in selecting an architect. Since educational facilities through the classroom environment strongly influence children during the formative years, only men of the highest integrity, judgment, business capacity, and artistic and technical ability should be chosen to provide architectural services.

6. Brooks, R. A. "Planning Better Schools: The Educator-Architect Thing," National Elementary Principal, LII:1 (September, 1972), 68-75.

   Guidelines for the relationship between educator and architect are established. Books stresses the need for a planning team (with the principal as the leader) and indicates information they must supply architect with. Brief discussion of fast-track scheduling and its benefits in school construction is included. Recommends hiring the principal well in advance and giving him major responsibilities in educational planning.

7. Fowler, Charles W. "Fill Those Loopholes in Your Architect's Agreement," Nation's Schools, 90:3 (September, 1972), 55-57.

   The author points out that each year schoolmen sign architectural agreements for millions of dollars of buildings. These agreements are based upon a standard form developed by A.I.A. Fowler sees the agreement form as adequate when no problems occur but...Fowler proposes a more tightly worded agreement and presents a model contract based upon the standard contract used by the New York City Board of Education. This contract includes a number of items not covered in the A.I.A. form. Fowler also suggests a new form for the contractor's agreement.

8. Garber, L. O., and Tyree, M. J. "Legal Principles Govern Employment of Architect," The Nation's Schools, 66:90-91, November 1960.

   The first in a series of four articles. This series describes litigations involving school boards and their architects, isolates legal principles set down by the higher courts, and refers to cases involving other types of corporate bodies and individuals when these are applicable to school situations. The first article reviews the legal considerations involved when a school system employs an architect.

9. Larson, A. A. "How to Hire the Right Architect for Your District," School Management, 5:64-68, September 1961.

   Hiring the architect is one of the few major decisions in school plant planning that the school board and superintendent must make almost entirely on their own. The author suggests a 10-step selection procedure. These steps are: be prepared, send out "feelers," eliminate disinterested architects, investigate, rank the architects (a suggested rating scale is presented), interview "high scorers," re-evaluation, visitation, final evaluation, and final interview.

B. The Architect's Work.

1. Guide for Planning Educational Facilities, pp. 42-44.

2. From School Program to School Plant, Chapters 8 and 9.

3. Planning America's School Buildings, Chapters 3, 6, and 11.

4. Abbott, James F. "Management Contracting Puts Contractor To Work Before the Work Begins," College and University Business, 51:2 (August, 1971), 8.

   Abbott argues the advantage of management contracting--protection of university from budget overruns, reduction of overall time of building, reduction of the possibility of errors and omission by architects and engineers. The process is traced through the building of a college dormitory to acquaint reader with the steps involved in management contracting. A special topic discussed is "pre-qualification" of contractors.

5. American Institute of Architects. "The Services of an Architect in School Building Planning," School Plant Studies, BT1-39, Washington, D. C.: American Institute of Architects.

   This paper lists ten functions of the architect in school facility planning. The authors expand on the architects' role in educational programming, preliminary drawings, working, drawings and specifications, estimate of cost, and construction supervision.

6. Canty, Donald. "What Architects Do and How to Pay Them," Architectural Forum, 119:92-95, September 1963.

   The title of this article aptly states the subject matter with which the author concerns himself. Laymen will be interested to note that the American Institute of Architects publishes the document entitled B-131 which is a standard owner-architect contract form. The author cautions, however, that B-131 is only a starting point for gaining an understanding of what the complex and changing profession of architecture is all about.

7. Caudill, William W. "Architecture by Team," C.E.F.P. Journal, 9:13-14, April 1971.

This is a report of a speech made at the ASBO/CEFP Joint Breakfast Caudill discussed the architect and his role in school facilities planning.

8. Educational Facilities Laboratories. SCSD: The Project and the Schools. New York: The Laboratories, 1967.

SCSD is a modular construction project for several school districts in California. In this publication, the SCSD approach to modular construction is analyzed in detail. The many illustrations add clarity to a very thorough and interesting report.

9. Engelhardt, N. L., Jr. "Time Required to Plan and Construct a School Building," American School Board Journal, 150:25-26, January 1965.

This article lists seven stages of planning and construction which affect the time of completion of a new school. These stages are selection of architect, preparation of the program of requirements, basic design, design, design development, final drawings and specifications, bidding, and construction.

10. Ernst, Leonard. "Will Design/Build Bidding Fulfill Its Promise or Founder On Its Problems," Nation's Schools, 93 (April, 1974), 33-36.

After citing the three advantages of design/build techniques in construction--saves money, saves time, eliminates hassle--Ernst presents six potential problem areas involved with this method. The problems are not insurmountable, but must be considered in the decision to move to design/build.

11. Franzen, Carl B., and Alkin, Marvin C. Legal Aspects of School Construction. Palo Alto, California: School Planning Laboratory, School of Education, Stanford University, 1964.

This monograph provides information concerning the many kinds of difficulties, particularly legal difficulties, that can occur during school construction activity. Also included are a number of suggestions for establishing safeguards against potential hazards so that these difficulties may be minimized or averted.

12. Fredrickson, John H. "The New Planning and Building Terms," School Management, 18 (January, 1974), 52-54.

An excellent short article which defines current terms in planning and building. Terms included are: design-build, fast-tracking, construction management, PERT and CPM, and Simu-school. A good introductory article.

13. Fredrickson, J. H. "An Analyses of Conventional and Experimental Approaches to School Design and Construction," Educational Technology, 12 (July, 1972), 60-63.

A review of the dominant approaches to school building in the past twenty years and a discussion of the integrated approach now in use (the integration of design and construction). Included is a study of 20 schools (10 conventionally built and 10 using the integrated approach) which shows savings by the integrated approach.

14. Gardner, John C. "Component System for Mass-Produced Schools," American School and University, 42:18, April 1970.

The author provides a concise summary of systems construction on modular design. He presents a history of the concept, the concept as it is applied in other fields, examples of systems construction already underway, and both pros and cons of the concept.

15. Griffin, C. W., Jr. Systems: An Approach to School Construction. New York: Educational Facilities Laboratories, 1971.

This booklet documents the industrialized techniques and materials of systems construction. Systems are essentially an erector set from which a school may be built to suit the demands of any community. Several case histories are included.

16. King, B. M., Baume, H. F., Sloop, L. P., Acheson, C. R., Urban, J. and Smith, F. J. "How to Write Good Construction Specifications for Educational Buildings," American School and University, 40:23-30, December 1967.

This article is a series of discussions of various aspects of construction specifications. Although educators would not prepare these specifications, it is helpful to see what must be considered since it will have direct bearing on the educational specifications which educators do prepare. This article does not discuss educational specifications as such but a great deal can be inferred.

17. Olfson, Lewy. "Building Codes: Something Needs to be Done," School Management, 14:48-52, March 1970.

The author in this article points out that while very necessary building codes can present educational planners with serious problems, these problems and ways to deal with them are described.

18. Scebra, J. Boyd. "A Checklist for Construction Planners," School Management, 16:6 (June, 1972).

Author served as business manager for a public school system in Tennessee and shared responsibility of managing physical and fiscal aspects of a $14 million dollar building program. From this experience he realized the need of a checklist of items to serve as a guide to school plant planners. Items included are: state specifications; soil tests and core drillings; site preparation; penalty clause; bidding of furniture and equipment; change orders; cost projections; and others.

19. "Single-Story vs. Multi-Story," School Management, 12:76-89, July 1968.

    The factors important in choosing between single and multi-story construction -- program, site, climate, safety, and cost -- are discussed in detail. The explanation is followed by several specific examples. This is a very concise and helpful article.

20. "What Construction Management Can Do For You," American School and University, 45:9 (May, 1973), 12-23.

    An interview with Charles B. Thomsen, a professional contract manager, explains in practical experience the advantages accrued through the use of contract management and fast-track scheduling. The site under discussion is a 3.5 million dollar high school delivered in 12.5 months. Thomsen explains the monetary advantages of CM and describes the twelve-month process.

21. "What It Takes To Be a Client, How To Turn a Set of Plans Into a Building," Architectural Forum, 120:106-109, April 1964.

    The author discusses the varying relationships which develop among the architect, the contractor(s) and the client-owner before, during and after the construction of a new building.

PART VII: MOVING IN AND SETTLING DOWN

A. Furniture and Equipment.

1. Guide for Planning Educational Facilities, Chapter 10.

2. From School Program to School Plant, pp. 209-213.

3. American School and University, all issues normally contain articles on this topic.

4. Brennan, Jean F. "The Evolution of School Furniture," American School Board Journal, 147:31-33, September 1963.

   An account of the history of American classroom furniture from early colonial times 300 years ago to modern day usage which concludes with some predictions for the future.

5. Engelhardt, N. L., Jr. "How to Purchase Equipment for a New School," School Management, 6:74-81, July 1962.

   This article presents a step-by-step program for determining equipment needs, for writing the educational specifications to fill these needs, and for putting them out to bid. Such a procedure can save time, money, and misery if carried out before the architect makes his first sketch.

6. Handel, Harvey. "How to Equip and Furnish the New School," School Executive, 77:45-51, March 1958.

   Equipping a new school cannot be compared to furnishing any other type of private or public building. The furniture in its rooms must reflect and assist the type of instruction which is planned for the room not only for the present but for the long-range future. The author offers some "do's and don'ts" to guide in equipping and furnishing a new school.

7. Pasnik, Marion. "Noninstitutional School Furniture," The National Elementary Principal, LII:1 (September, 1972).

   New noninstitutional furniture will have noise absorbing qualities, be part of a systems grouping, be simple in shape, light in weight and mobile, and have multiple uses. Its intention is to create a warm, inviting environment for learning. Interesting and innovative examples are cited.

8. "School Furniture," American School Board Journal, 150:31-58, March 1965.

   This citation is, in fact, a collection of articles and advertisements -- a separate "bookazine" dealing with school furniture. Articles appearing in this section are:

   a. "Present Furniture Trends Promise Exciting Future," B. W. Henrikson
   b. "Aesthetic Value Being Violated," Harold Silverthorn
   c. "New Language in Library Furnishings," Bernard Morsheles
   d. "Mr. Administrator: Bear Fatigue...On Your Feet," Robert Propst
   e. "Accumulative Storage Problem Has Flexible Solution," Joseph St. Cyr
   f. "Refinish?. . .Replace? Here's the Answer," H. S. Warvel
   g. "Furniture-Tools of Learning," Pictorial Feature
   h. "Save Space, Follows With Multi-use Rooms," Thomas J. McCarthy
   i. "Specific or General-Shops Require Individual Planning"
   j. "Teamwork Science Habit-Results In Ideal Lab," James R. Irving
   k. "Sample Purchasing Proves Practical Method," William L. Boyd
   l. "Service Gets Its Efficiency From Proper Equipment," Thomas Farley
   m. "New Products In the Field"

9. Schott, Willis M. "Selection of Furniture and Equipment," Preconstruction Planning For Educational Facilities. Wallace Strevell, editor, Chicago: Association of School Business Officials, 1972.

   The author relates the selection of equipment to the educational specifications and emphasizes the school business officer's role in selection and purchase of equipment. An aid to teachers serving on planning committees is provided in his appendix "Let's Think Of the Perfect Classroom." Classroom furniture as well as equipment for other building and grounds areas is treated.

B. Occupying a New School Plant.

1. From School Program to School Plant, Chapter 10.

2. Cramer, Harold L. Orienting Users For New Facilities. Chicago: Simu-School Center for Urban Educational Planning, 1973.

   This monograph addresses itself to some important guidelines in conducting a program of user orientation to new facilities. With the advent of innovative design concepts, new materials, sophisticated equipment, and varying curriculum/instruction programs; proper utilization of new facilities can suffer from lack of adequate knowledge.

3. "How Teachers Are Being Taught to Use the New McPherson High School," School Management, 6:63-67, April 1962.

   Given a new school with almost every modern idea which can be incorporated into a modern building, one would expect great things. Not so, state the authors, unless teachers are taught to use the new facilities. School personnel at McPherson, Kansas, have developed a five stage program to perform this task. Pictures and illustrations supplement the text.

4. "Using a New School," School Executive, 71:59-70, December 1951.

   Many people use a new school building: children, adults, teachers, janitors, lunchroom employees, engineers. All these people should be taught to use it. This is a series of articles devoted to this subject. Titles of articles in this series include:

   a. "The Superintendent Teachers Use of New Plants," Shaw, Archibald
   b. "Teaching the Staff," Atwan, A. M.
   c. "Teaching the Custodian," Norrix, Loy
   d. "Teaching Community Agencies," Monson, Eva C.
   e. "Teaching the Community," Little, Harry A.

5. Wright, Ralph, and Johnson, Jennings. "Moving Into a New School," Overview, 2:61-62, April 1961.

   When moving into a new school from a former school, adequate planning and preparation can make the task smoother and easier. Suggestions are offered by the author for the school staff contemplating this task which if followed can ease the tensions usually inherent in such a move.

C. Assembling Building Documents.

   1. From School Program to School Plant, pp. 217-218.

D. Presenting the Building to the Public.

   1. From School Program to School Plant, pp. 215-217.

   2. Crosby, O. A. "Build Community Friendship at School Plant Dedication," The Nation's Schools, 60:60-63, October 1957.

      "The dedication of a school building is a special occasion for bringing the people of the community into the school, as well as for bringing information about schools to the people." Many

opportunities are provided through the dedication ceremony to advance the cause of the school and to create an aura of good feeling among school patrons. Suggestions concerning timing, program items and other facets of a successful dedication program.

3. Holmes, G. W. "Acquainting Faculty and Community With the New Plant," High School Journal, 40:63-66, November 1956.

   "The best way to introduce faculty and community to the new school plant is to encourage them to participate in planning." The author offers suggestions concerning how to implement this and other types of methods to acquaint faculty and community with new school buildings.

E. Evaluating the Building.

1. Guide for Planning Educational Facilities, pp. 191-196.

2. See Part V, Section D, Tactical Planning District-wide Building Survey, "Plant Evaluation," for additional references.

PART VIII: RELATED TOPICS

A. Who Should Be Involved?

1. Guide for Planning Educational Facilities, pp. 13, 17, 18.

2. Creative Planning of Educational Facilities, pp. 146-147.

3. From School Program to School Plant, Chapters 1 and 7.

4. Planning America's School Buildings, Chapter 11.

5. Beckman, Ronald. "The Human Factor in Design...More Than Just a Pretty Chair," American School and University, 43 (April 1971) 20-27.

   The author strongly advocates involving the community in school facility planning. The community will have more pride in their schools, support them better and identify with them if they take part in planning. Illustrations of private schools' growth and support where people felt they had no voice in the public schools are made.

6. Brown, Daniel L. "Total Client Involvement in School Design," Phi Delta Kappan, LVI:5 (January, 1975), 349-351.

   Brown argues the need for faculty, community, and student involvement in the design of new buildings and in the design of the programs being used in those buildings. Using his own

district as a case study, Brown describes the planning and preparation that went into the opening of Long Branch Elementary in Arlington, Virginia. This preparation included a staff planning committee and a joint citizens advisory committee which participated in the plans for building, curriculum design, staff development, and equipment purchase.

7. Grossman, H. J. "Planner Looks at Schools," American School Board Journal, 150:27-28, May 1965.

   The author provides a discussion of the elements which go into school site selection. He strongly advocates cooperation with city and community planners. A 12-item list of criteria for school site selection is included.

8. Herrick, John H. "Architect vs. Educational Consultant -- Services are Distinct and Different," The Nation's Schools, 44:34, October 1949.

   This article is one of a triad presenting three points of view. Here Dr. Herrick contends that the educational consultant and the architect are symbolic members of the planning team whose services are distinct and different but each vital to the other.

9. Stode, Charles Edward. "Let Everyone Be Heard," Michigan Education Journal, 46:20-21, November 1, 1968.

   "The school that functionally and aesthetically satisfies students, teachers, administrators, and community is the school in whose conception and realization these people have played an active role," beginning with this statement this article points out the need for cooperative planning by all in order to insure a quality facility.

10. "Teachers Designed This School," School Management, 12:20-35, August 1968.

    This article describes the process of preparing educational specifications by the teachers in Goshen, New York. The result was not only a very usable and still innovative building, but also such side effects as improved public relations and inter-staff relations.

11. "Using Students as School Design Consultants," School Management, 12:81-84, November 1968.

    The possible contributions of students to the process of designing schools is described in this article. Included are many examples of the types of things that students recommend and desire.

B. Remodeling and Renovating.

1. Guide for Planning Educational Facilities, Chapter 12.

2. Creative Planning of Educational Facilities, Chapter 15.

3. Planning America's School Buildings, Chapter 13.

4. Ashley, Warren H. "Six Reasons Why: You Should Consider 'Recycling' Before Turning to New Construction," School Management, 17:17 (September, 1973).

Reasons for "recycling" rather than constructing new facilities include: 1) no need to purchase land, 2) no site engineering problems, 3) most utility services already exist, 4) the gross structure of the building already exists, 5) transportation patterns are present, 6) cost for modernizing is frequently less than new construction.

5. Brubaker, C. William, and Edmund Sonnenschein. "Towers Hold Displaced Services," Nation's Schools, 91:4 (April, 1973).

Remodeling 49-year old Washington-Lee High School, Arlington, Virginia, architects relocated existing toilets and electrical service lines, installed elevators required by state law, and housed new air-conditioning equipment in newly erected 25-foot square twin towers. Towers saved space and expedited remodeling process because they were constructed first, thereby able to remodel half a floor at a time with no loss of service to the other half. Following phases of the recycling project included knocking out walls, putting in ducts for air-conditioning, installing carpeting and furnishings--one-half floor at a time without closing the school.

6. "Can You Renovate During the School Year?", School Management, 9:168-171, July 1965.

This article explains how a school system installed a new boiler system during the school year. The author emphasizes the importance of planning and demonstrates that buildings can be renovated without disturbing class activities.

7. Castaldi, Basil. "Generalized Mathematical Formula for School Modernization," American School Board Journal, 148:41-43, January 1964.

The author presents a general formula which provides a systematic and logical approach in the decision-making process underlying school modernization. It places a strong emphasis on facts and enables school planners to base decisions on desirable educational outcomes and financial efficiency.

8. Clinchy, Evans. "The Vanishing Schoolhouse," National Elementary Principal, Vol. 11, No. 1 (September, 1972).

Rebellion against the cost of building new schools and the desire to broaden and humanize the education of children are the two prime motivating factors in the changes taking place in educational facilities planning--utilization of space immediately available which had been erected for another purpose. Author

cites working examples, and points out the benefits of joint occupancy, particularly in cities where land is expensive and hard to obtain. Integration of school facilities within a community which creates a new institution that is far more useful to more people than the conventional school.

9. Dolan, G. E. "Old School Gets New Light," American School Board Journal, 150:46-47, June 1965.

   Tackling the problem of re-lighting an old building can be more challenging and exciting than planning lighting systems for new buildings.

10. Found Spaces and Equipment for Children's Centers. New York: Educational Facilities Laboratories, March 1972.

    Publication speaks to the pressing need for preschools and day care centers and the meager funds thus far allotted for them. Well illustrated examples of utilization of found space, furniture and equipment, outdoor spaces and outdoor things effectively attest to the fact that found things and spaces have their own unique values and for all children they can create a world more exhilarating than the finished and store-bought. A chapter entitled "How to Go About It" includes a list of sources for help, licensing requirements and codes, and a checklist for found objects.

11. Fredrickson, John H. "How to Make Old Buildings Meet New Needs," American School and University, 47:1 (September, 1974), 37-41.

    With decreasing enrollment and a tightening of the money supply, schools may well be turning to renovation of existing structures rather than new buildings as a way of meeting their building needs. Fredrickson details the procedures for determining if renovation is feasible and desired. The stress of the article is upon considering renovation as but one part in a master plan of future building needs. This master plan is developed through a careful and thoughtful needs assessment.

12. Graves, Ben. "Modernization," Nation's Schools, 87:57-93, April 1971.

    This feature article concerning the modernization of school facilities is very complete and informative. Included are charts, illustrations, and pictures that summarize and clarify the presentation. Additions are also discussed with special attention to advantates and disadvantages of specific types of additions. Eight case studies are presented to illustrate modernization.

13. Graves, Ben E. "New Life For Old Schools," National Elementary Principal, 52 (September, 1972), 76-77.

    A feature article on modernization of existing facilities. Emphasis is placed upon four areas that need consideration in

deciding whether to modernize or replace existing facilities. They include: 1) safety, 2) educational adequacy, 3) location, and 4) site. The article also provides guidelines for proceeding once the modernization decision has been made.

14. Miller, Richard P. "Renovating With the Systems Approach," American School and University, 43:11 (July, 1970), 32-33.

The title is somewhat misleading in that Miller writes about building an addition to a building via system construction. System construction is a modular approach to building developed under the auspices of EFL. Miller argues for the flexibility and adaptability of this approach in describing the Adams Central Community Schools. The addition is an open space design including a learning center and provision for large group instruction.

15. Protected Educational Facilities in Found Space. TR-78, May 1973, U.S. Office of Education, Defense Civil Preparedness Agency.

A guide for educators and planners in recycling noneducational space for schools so that it is a learning environment protected from hazards and is safe and healthful. Publication examines the planning principles the planner can use to achieve this objective and, through a series of questions, assists planner in evaluation of potential space for conversion. Examples of successful conversions are shown.

16. Roaden, O. Paul. "Reclaimed Space--A Partial Solution to the School Housing Dilemma," School Business Affairs, November 1974.

Predicted decrease in elementary and secondary school enrollments thus far has not brought about a surplus of educational facilities, and, even if school enrollments decline more than projected, there still will not be a surplus. Real problem for educational facilities planners is providing right kinds of educational facilities in right place. Examples of facilities reclaimed for school use are post offices, military installations, hotels, office buildings, factories, warehouses, churches, supermarkets, armories. Author cites examples in Ohio and sets forth several advantages to this type of facilities planning.

17. "Rush to Remodel," Nation's Schools, 91 (April, 1973), 63-73.

A rather comprehensive article dealing with planning, design and construction phases of a remodeling program. Eight case studies are presented along with general problems associated with remodeling.

18. Sessions, E. B. Rehabilitation of Existing School Buildings or Construction of New Buildings, Research Bulletin No. 2. Chicago: The Research Corporation of the Association of School Business Officials, 1964.

This report, in questionnaire form, deals with the problems of school building rehabilitation under four headings: Educational Obsolescence, and Site and Location Obsolescence, Structural Obsolescence, and Additional Considerations. The questions when answered in terms of specific school systems can serve as a guide for determining whether to build a new or to rehabilitate old structures.

19. "Should We Renovate, Remodel or Demolish?" American School and University, 45, 7 (March, 1973), 18-28.

    A discussion on how to prepare for the renovation and remodeling boom which is being paralleled by the decline in new construction starts. The educational program, economy, and new uses of old space are highlighted as topics for consideration in remodeling.

20. Truesdell, William H. "The New Importance of Renovation," School Management, 17:7 (August/September, 1973), 12-14.

    The article describes problems encountered in renovating a dying school building. An illustration of the renovation of Comstock Middle School, with the work done by the planning committee, is made. Community involvement is stressed along with the need for examining what might be accomplished with older buildings.

C. The School Site.

1. Guide for Planning Educational Facilities, Chapter 6.

2. Creative Planning of Educational Facilities, pp. 152-155.

3. From School Program to School Plant, Chapters 4 and 12.

4. Planning America's School Buildings, Chapter 10.

5. Carioti, Frank V. A College Grows In the Inner City, Detroit: Detroit Institute of Technology, 1966.

   Case study of an institution faced with growth in an urban setting and the issue of moving versus expanding an existing location.

6. Darby, F. C., and Von Metske, R. "Slope Plan Pinpoints New School Sites," The Nation's Schools, 68:50-54, August 1961.

   The authors present a plan for selecting school sites based on an analysis of topographical factors. Assumptions are held that usable ultimate density factors can be developed for arbitrary land slope categories and that residential densities will be roughly inversely proportional to the slope of the land, that is, most of the people will reside on the mountainous terrain. Slope category factors are not universally applicable. A careful analysis of past, present and proposed land development practices on land, lying within or close to the study area, is necessary in order to develop these factors for a given area.

7. Educational Facilities Laboratories, Inc. A College in the City: An Alternative. New York: EFL, Inc., 1968.

Report of planning for a college in the Bedford - Stuyvesant are of New York with the "campus" dispersed throughout the area.

8. Hanson, Robert F. "Playgrounds Designed for Adventure," Journal of Health, Physical Education, and Recreation, 40:34-36, May 1969.

The author correctly describes many playgrounds today as a "proliferation of iron bars cemented into a stark desert of asphalt." Other alternatives are available and some of these are described. The illustrations are very good.

9. McCall, M. K., et al. Schoolsite: A Game of Conflict Resolution in School Facilities Planning. Chicago: Project Simu-School, 1972.

A simulation, making use of educational gaming, in educational facilities planning. The simulation game of conflict resolution in the choice of a school site contains players manuals for school board members and non-school board members. Players take the part of persons who are active in decision making--they could be alderman, city engineers, or preservation groups. Emphasizes the need for community involvement and the complexity of planning issues.

10. Mittelsteadt, Arthur H., Jr. "Planning School Grounds," Journal of Health Physical Education and Recreation, 40:37-40, May 1969.

This author describes adequately the people and processes involved in planning the outdoor portions of an educational facility. It is stressed that the outdoors is just as vital to education as the indoor spaces and also requires as thorough planning.

11. Tonigan, Richard. "Keeping the School Site an Asset," School Management, 14:6 (June, 1970) 34-36.

School sites should be programmatically organized and systematically managed. After analyzing the total school community program to be offered and identifying all site related requirements, developers of a school site assemble a complicated puzzle assigning portions of the site to building location, program function, pedestrian, and vehicle areas. Contributions that a well-planned site can make to community improvement should not be overlooked.

12. Wynn, William J. "The Modern Secondary School Site -- Or Is It Sight," High School Journal, 44:154-156, January 1961.

School administrators must look beyond the usual considerations in selecting school sites. Future programs must be provided for through imaginative advance program analysis and planning. The author sums up his thoughts in five terse guiding statements.

13. The following are examples of Campus Development Plans:

a. Caudill, Rowlett and Scott. Campus Planning Study, The Ohio State University, Phase II. Houston: The Authors, 1961.

b. Rogers, Joseph Lee, Jr., et al. Physical Development Plan: The University of Oklahoma and Environs, 1965-1985. Norman: University of Oklahoma Research Institute, 1966.

c. Warneke, John Carl, et al. Long Range Development Plan, University of California, Santa Cruz. San Francisco: The Authors, 1963.

d. Wayne State University, University City: A Summary of a General Master Plan for Wayne State University and a Related Urban Renewal Project. Detroit: The Author, 1961.

D. Environmental Consideration.

1. General.

a. Gilliland, John W. "How Environment Affects Learning," American School and University, 42:48-49, December 1969.

The basic elements of the environment of a school are explored in this article. These elements included the termal environment, the acoustical environment, and the visual environment. This is a good, general treatment of the environmental needs of a school.

b. "Planning the Physical Environment," Special Report. Nation's Schools, 94:2 (August, 1974).

A special issue devoted to environmental aspects of schools with feature articles on

- media center environment
- interior environments
- school vandalism
- educational technology centers
- open campus schools

c. U. S. Public Health Service Division of Environmental Engineering and Food Protection. Environmental Engineering for the School: A Manual of Recommended Practice. Publication No. 856. Prepared by Floyd B. Taylor and others. Washington, D. C., U. S. Government Printing Office, 1961.

A succinct and practical presentation of public health considerations in the school plant. That the environment in which school children spend a large portion of their day should be both as suitable and as healthful as possible has been an accepted premise for many years. This document is intended as an overall statement of basic environmental criteria for schools, by which either existing or planned facilities could be evaluated. Checklists offered at the ends of each chapter

can be of help for this latter purpose.

d. "The Unrecognized Environmental Curriculum," Phi Delta Kappan. Vol. LVI, No. 5 (January, 1975).

A special issue devoted to environmental considerations in schools and new trends in school facility planning. Articles included are:

- the unrecognized environmental curriculum
- spaces that engage, retain and respond
- crowding and the educational process
- the recycled school
- an environmental perspective on educational planning
- the slow and agonizing death of the factory school
- environmental flexibility for preschoolers

and several others devoted to school environment.

2. Thermal Environment.

a. Guide for Planning Educational Facilities, pp. 114-119.

b. Creative Planning of Educational Facilities, pp. 213-217.

c. From School Program to School Plant, pp. 193-194, and Chapter 22.

d. Planning America's School Buildings, Chapter 14.

e. Collins, Carol. "Solar Energy for Heating Schools," The Science Teacher, 41:7 (October, 1974) 28-29.

A description of the solar energy heating experiment in Warrenton, Virginia. The basic components of the process are explained.

f. "Four Schools Put Solar Heating to the Test," American School and University, 46:11 (July, 1974), 17-21.

As part of a federally-funded project, four schools have switched to solar energy for a portion of their heating needs. The schools located in Massachusetts, Minnesota, Maryland, and Virginia are testing variations of solar heating approaches. The experiments thus far show marked success and give some suggestion of sources for future energy.

g. Jones, Philip G. "Will Children's Learning Be Stunted, and Teachers Irked By Low School Temperatures?", The American School Board Journal, 161:1 (January, 1974), p. 34.

America has the warmest schools of any nation in the world. Once children enter the classrooms, a desirable temperature can be maintained by cooling classrooms, not heating them. Physiologists point out that the American penchant for high indoor temperatures is cultural not physiological. Many of

the answers to energy problems can be related to clothing.

h. Schutte, Frederick. "That Elusive, Eclectic Thing Called Thermal Environment: What a Board Should Do About It," American School Board Journal, 157:12 (June, 1970), 17-23.

Schutte discusses the challenges presented to heating engineers in maintaining adequate climates within the modern school. Of particular interest to Schutte are the problems presented by the growing use of the computer in schools and the termal environment demanded by that equipment. The article also discusses the demands of expanded music programs upon thermal control. Contrary to the title, the author identifies problems, but says little about how to solve them.

i. Smith, Nelson. "The Case for Airconditioned Schools," The Education Digest, Vol. XXXVII, No. 6, February, 1972.

Changing social demands likely will increase the amount of summer school. Four compelling reasons for airconditioned schools: (1) improves learning; (2) reduces building costs by giving architect greater flexibility in design; (3) costs a great deal more to install airconditioning in an existing building than to install it during original construction; (4) reduces cost of building maintenance. In newer buildings designed for airconditioning, heating costs will be less due to compact design, increased insulation and smaller glass areas. Ancillary benefit· protection provided sophisticated audiovisual equipment.

j. Stuart, Fred, and Curtis, H. A. Climate Controlled and Non-Climate Controlled Schools. Clearwater, Florida: Pinellas County Board of Public Instruction, 1964.

This research study compared the cost of construction of one climate controlled building with that of non-climate controlled school and attempted to determine the similarities and differences between the climated controlled and non-climate controlled schools with respect to operating costs and general quality and the comfort, achievement, conduct and health of the students.

k. "Two Studies on Thermal Environment and Learning," American School Board Journal, 147:22-4, December 1963.

This article is a report of studies on school thermal conditions conducted by the Iowa Center for Research in School Administration, University of Iowa, Iowa City, Iowa, in cooperation with Lennox Industries, Inc., Marshall Town. Results show that there is a correlation between thermal environment and mental efficiency.

l. Wright, Henry. "Some Blunt Facts About Air Conditioned Schools," School Management, 4:62-66, April 1960.

As the key to summer time schooling, air conditioning, by opening the door to full-time operation of the educational system may turn out to be one of the most important things which has happened to schools and schooling in recent years. On this basis, it warrants the careful scrutiny of everyone interested in educational progress. This article provides factual data about comparative costs and about the need for air conditioning in public schools.

3. Visual Environment.

a. Guide for Planning Educational Facilities, pp. 127-132.

b. Creative Planning for Educational Facilities, pp. 194-201.

c. From School Program to School Plant, Chapter 21.

d. Planning America's School Buildings, Chapter 9.

e. American Standard Association. American Standard Guide for School Lighting. New York: Illuminating Engineering Society, 1962.

This guide provides advice for those designing lighting systems in terms of acceptable standards based on research and field practice. It is also a good source for those interested in the general aspects of the visual environment of school classrooms.

f. Gibson, C. D. "Today's Concepts in School Lighting," American School Board Journal, 150:21-24, June 1965.

Responsible administrators can do much to improve seeing conditions in school buildings without improving lighting systems or spending additional money for equipment or supplies.

g. Ketcham, Howard. "These Colors Fit Your School Decor," The Nation's Schools, 74:61, 80, November 1964.

Avoid raw red, intense orange, purple and white in school interior decor advises Howard Ketcham, but make use of imaginative color treatments for classrooms, corridors, and assembly rooms. Studies show that proper color scheming can make a difference in the social habits, health, and safety habits, work habits, and in performance in the content subjects. Recommended colors include apricot, blue and buff with various shadings as indicated by lighting conditions.

h. Knirk, Frederick G. "Acoustical and Visual Environments Affect Learning," Audiovisual Instruction, 15:8 (October, 1970), 34-35.

Knirk explains some of the effects that particular acoustical and visual environments may have upon children and recommends that these effects be accounted for in building design. He also gives basic suggestions for controlling disturbing sound or light sources.

i. LaGuisa, Frank F. "Select Lighting With Energy in Mind," American School and University, 46:54 (March, 1974), 54-55.

As concern for energy conservation grows, it becomes imperative that schools begin to look at variations in lighting schemes within a building. Lighting should be designed to meet the educational objectives of the particular area. Study areas demand different lighting approaches than classroom areas, for instance. The author stresses the value of modular lighting and gives specific suggestions for proper lighting equipment.

j. "New Developments in Lighting," American School and University, 46:12 (August, 1974), 31-2.

The article relates two experimental studies. The first shows that "students experience a significant increase in visual acuity and a reduction in overall fatigue when studying under lighting that closely approximates sunlight," i.e., full spectrum light. A second experiment shows significant increase in attention span with the use of "brightness patterns" supplied by spotlights and light-boxes.

4. Sonic Environment.

a. Guide for Planning Educational Facilities, pp. 119-127.

b. Creative Planning for Educational Facilities, pp. 185-194.

c. From School Program to School Plant, Chapter 21.

d. Planning America's School Buildings, Chapter 9.

e. Conrad, M. J., and Gibbins, Neil. Carpeting and Learning, Columbus: Bureau of Education, Research and Service, The Ohio State University.

This study of acoustical floor covering was developed to determine how carpeting affects the total sonic environment and whether it has any effect upon pupil behavior and learning.

f. Fitzroy, David, and Reid, John Lyon. Acoustical Environment of School Buildings, New York: Educational Facilities Laboratories, 1963.

This report is a detailed study conducted by an architect and an acoustical engineer and questions some long-standing "authoritative" standards. Although this is a technical report, it has some interesting content for the non-technical reader.

g. Richards, Roy. "Thoughts on School Acoustics," American School Board Journal, 145:25-38, July 1962.

It is possible, through the proper application of basic physical principles, to create almost any desired acoustical terms is made and some suggestions are offered about acoustical design in the several parts of the school building.

E. Flexibility and Expansion.

1. Guide for Planning Educational Facilities, pp. 153-154.

2. Creative Planning for Educational Facilities, Chapter 9.

3. Educational Facilities Laboratories. Bricks and Mortarboards. New York: The Laboratories, 1965.

   A report on problems facing higher education and how space can be provided for changing enrollment patterns. A guide on how space can be made adaptable to the inevitable changes in the educational process in the decades ahead.

4. Educational Facilities Laboratories. Five Open Plan High Schools. New York: The Laboratories, 1973.

   With the recent interest in open schools at the secondary level, EFL prepared this report "to assist administrators in determining what they may need for their own districts." There is no attempt to endorse a particular design and strengths and weaknesses of each design are presented.

5. Richardson, L. S., and Caudill, William W. "Towards an Economical Flexibility," American School and University, 1954-55, pp. 441-448.

   This report shows how one school district obtained economical flexibility in the design of its new high school by 1) arranging space for an increasing enrollment, and 2) by providing space to house any type of curriculum -- all this on a limited budget. An excellent discussion of flexibility in schoolhouse construction and an interesting delineation of the quality of expandability the quality of convertibility, and the quality of versatility can be found here.

6. Silverthorn, Harold. "Flexibility, A Fact or an Illusion?", American School Board Journal, 150:19-21, January 1965.

   The author presents William Caudill's analysis of the three types of flexibility (immediate, overnight, and over-the-summer), lists 13 "earmarks" of adaptable space, and provides visual evidence of the modifiability potential of a school building in a set of four pictures.

7. Weinstock, Ruth. Space and Dollars: An Urban University Expands. New York: Educational Facilities Laboratories, Inc.

   The economics of physical expansion in an urban setting using the problem of Drexel Institute of Technology as a case study.

F. Economy.

1. General Considerations.

a. Guide for Planning Educational Facilities, Chapter 11.

b. Creative Planning of Educational Facilities, pp. 163-171.

c. From School Program to School Plant, Chapter 23.

d. Planning America's School Buildings, Chapter 12.

e. Anderson, G. Ernest, Jr. "How Simulation Catches Costly Planning Errors," Nation's Schools, 82:40, August 1968.

The article is a brief description of simulation, particularly computer simulation and how it can be used to identify planning program. The article includes a discussion of the difficulties usually encountered in simulations.

f. Ashley, Warren H. "School Architecture: The Public Is Flunking Its Course," American School and University, 45:3 (November, 1972), 12-16.

Ashley, an architect, is concerned that in its efforts to reduce costs the public is focusing upon the wrong things. They refuse to correct the fundamental problem of cost, the school itself. The public must (1) recognize that it is difficult if not impossible to adapt changing educational requirements without first changing the character of the school itself, (2) recognize that a drastic change in the hierarchy -- differentiated staffing is one way to reduce costs, (3) recognize the demand for flexibility will intensify, (4) recognize that technology will have increasing impact on the schools and (5) recognize the educational needs of the total community.

g. Boles, Harold W. 258 Ways to Save Money in Planning and Constructing School Buildings. Kalamazoo: School of Graduate Studies, Western Michigan University, 1963.

This booklet presents a comprehensive list of economy factors, most of which are universally applicable to reducing costs of school plants.

h. Clinchy, Evans. Schools: More Space, Less Money. New York: Educational Facilities Laboratories, Inc., 1971.

Article analyzes alternative solutions to school space problems, such as unused space in outdated buildings, local factories, warehouses, etc. Author also analyzes open campus plans, the extended day, the extended school year, open space schools, systems approaches, fast tracking, sharing space, and floating schools. Future implications of "shared" educational facilities are set forth, as well as definite implications in new school design to accommodate the open campus effect on libraries, cafeterias, and multi-use areas.

i. Educational Facilities Laboratories. The Cost of a Schoolhouse. New York: The Laboratories, 1960.

A report designed to assist school board members in coming to a better understanding about some of the elements of school building costs and to help them ask the kinds of questions which make it possible to secure more efficient buildings.

j. Gores, Harold B., and Green, Alan C. "Building Ideas That Save Money," American School and University. 43:6 (February 1971), 13-32.

In an interview format Gores and Green talk about money-saving techniques in building. They discuss systems building, fast track planning, open design in educational structures, joint occupancy, remodeling and conversion of space. A good article to get a handle on what is happening in economical building approaches.

k. National Council on Schoolhouse Construction. Principles of Economy in School Plant Planning and Construction. Nashville: The Council, 1954.

This manual focuses attention on certain basic principles of economy and illustrates these with some proposed economies in school plant planning and construction. An extensive bibliography is included.

l. "Ten Deceptions in Building Cost Comparisons," Overview, 3:36-39, July 1962.

Comparisons made between the cost of one school building and another are subject to a number of factors which must be taken into account before anyone can judge whether a particular building costs more or less than others like it. This article is a compilation of 10 or more important factors which may have more influence than inflation on unit costs for a given building.

m. "Voters Won Over By Low-cost Building System," American School and University, 45:7 (March, 1973), 46-47.

Description of one community's approach to building an economical, yet educationally sound facility through sy building.

2. Energy Conservation.

a. Educational Facilities Laboratories. The Economy of Energy Conservation In Educational Facilities. New York: The Laboratories, 1973.

Recommendations for reducing energy consumption in existing buildings, remodeled projects and future buildings. Explains the importance of including long-term operating costs and evaluating capital costs of electrical and mechanical systems. Emphasizes increasing the sophistication of operating personnel in regard to energy problems, identifying sources of waste, including energy conservation as a major part of architectural programs, and using life cycle costing instead of initial cost for contract awards.

b. "Energy Conservation. A New Challenge for Education," CEFP Journal Special Report 9. (August, 1973).

A detailed and comprehensive study of the energy problem as it pertains to school plant operation and pupil transportation. Section titles: Fuel Supply and Selection; Study of the Potential for Energy Conservation in Schools; Effective Seeing In an Era of Energy Conservation; Dealing With Energy Conservation Alternatives; Summary: A Big Challenge Ahead for Planners.

c. "Energy Crisis: What Schools Are Doing About It," American School and University, 46:6 (February, 1974).

American School and University contacted schools, colleges and universities throughout the country to find out what measures were being taken to conserve energy. Many readers emphasized closing the schools would be one of the last ways to save energy. The ideas received are presented in a checklist style in this article and have the following headings: Administrative; Heating, Ventilating, Air Conditioning; Buildings; Transportation; Lighting; Equipment; Water.

d. Hunt, Margaret. "Sun Lightens Heating Load for Four Schools," Nation's Schools, 93:3 (March, 1974).

Under a National Science Foundation project titled "Solar Energy -- School Heating Augmentation Experiments" four existing schools in Maryland, Massachusetts, Minnesota, and Virginia are reaping benefits of more than $1 million worth of NSF contracts. Installations differ in size and detail, but basically they work the same way: a solar collector, placed on the roof or on the ground near the school buildings, absorbs the sun's heat. After water in pipes heated by sun to 130^{o} or 140^{o} in collector, it is pumped directly to heating units or heavily insulated storage tank for use when needed. Storage tank can keep water hot enough to heat a building for up to five days of overcast. The experiments differ slightly in specifics, and the contracts ensure wide geographic data by covering installations in rural, urban and suburban schools in four locations that vary considerably in climate.

e. Phipps, H., Harry, P. E. "New Schools Need New Energy Concepts," American School and University, 45:5 (January, 1973).

School design spotlight is focused solely on new concepts of construction and space utilization, and virtually no substantive research done on energy requirements of new and remodeled educational facilities. Almost invariably author has found that those systems with the least adverse effects on the environment are those systems that provide lowest long-term owning and operating cost. Author makes plea to educational facilities planners to recognize vital importance of energy conservation and its future effects on both the ecology of the nation and the economics of the school.

f. Rittelmann, Richard. "Design New Buildings to Save Energy--and Money," American School and University, 46:5 (January, 1974).

Author, an architect, is convinced mechanical and electrical consulting engineers must be more prominent members of the planning team. Article offers valuable information concerning heat recovery techniques, a re-evaluation of standards for ventilation and lighting and an explanation of why topography must be considered as shelter for buildings whenever possible.

G. Size of the Center.

1. Creative Planning of Educational Facilities, pp. 55-56.

2. From School Program to School Plant, pp. 69, 90-93, 226-227.

3. Barker, Roger G. and Gump, Paul V. Big School, Small School: High School Size and Student Behavior, Stanford, California: Stanford University Press, 1964.

A study of school size in relation to the behavioral aspects of the student body in which the authors conclude that "a school should be sufficiently small that all of its students are needed for its enterprises. A school should be small enough that students are not redundant."

4. Brubaker, Charles W., and Leggett, Stanton. "How to Create Territory for Learning in the Secondary School," Nation's Schools, 81:67-91, March 1968.

This article describes one approach to housing a large number of students on one site. The basic concept employed has been termed the "Turf Concept." Many drawings and illustrations are included.

5. Candoli, I. C. and Leu, Donald. "A Feasibility Study of the Cultural-Educational Park for Chicago," Chicago: Board of Education, 1968.

This report contains an excellent discussion of the educational park concept and its historical development along with the analysis of the feasibility of the concept in the Chicago community.

6. Gold, August. "The Resurgence of the Small School in the City," Phi Delta Kappan, LVI:5 (January, 1975), 313-315.

Gold, Director of Facility Planning, New York City, cites the growing advantages of constructing small schools in the city. Advantages include better person-to-person relations in the school, more neighborhood-based schools, more sites available for small schools, and ability to utilize found-space.

7. Livingston, A. Hugh. "Is There An Optimum Size High School?" Progressive Education, 33:156-159, September 1956.

The complexity of the problems involved in the question of optimum size for a high school makes such a determination difficult to achieve. However, weighing many factors leads the author to conclude that economy increases vary little with school populations larger than 1,200 students and enrollments beyond 2,000 do not result in other than duplication of already existing services and experience.

8. MacVittle, R. W. "Are Our Elementary Schools Too Large?" Nation's Schools, 53:56-57, June 1954.

The author contends in this article that large elementary schools tend to interfere with opportunities for children to engage in social interaction. Therefore, he advocates "small elementary schools for small children in small numbers." Capacities of elementary buildings should range from 300 to 400 pupils and contain no more than 12 to 14 rooms.

9. Mauch, James E. "The Educational Park," American School Board Journal, 150:9-11, March 1965.

This article advances the idea of an "educational park" as a means of satisfying the goals of school desegregation and quality education. Critical elements for an education park are size, location, and excellence and variety in program, instruction, and facilities.

10. Meeker, Robert, and Weiler, Daniel L. "A New School For The Cities," Education and Urban Society, 3:11 (February, 1971).

The article demonstrates a proposed 2,600 enrollment model school for an urban area. Primary considerations in determining school size were: 1) student job program, 2) differentiated staffing, 3) functional unification, 4) physical plant, 5) community interaction, 6) the dual curriculum of the school.

11. Smith, Clifford B. "A Study of the Optimum Size of Secondary Schools," Unpublished Ph.D. dissertation, The Ohio State University, 1960.

The study has a four-fold purpose. An attempt was made to: 1) determine the relationship of secondary school size to cost, 2) to determine the relationship of secondary school size to certain program effectiveness factors, 3) to determine the effect of selected community characteristics on the size-factor relationships and 4) to determine an optimal school size range for 3 and 4 year secondary schools in Ohio. The findings of the study indicate that, when all factors are considered, the favorable factors approach the maximum and the unfavorable factors approach the minimum when the size range of the secondary school is 800 to 1,200.

A summary statement of the findings of this dissertation may be found in the September, 1962, Ohio School Boards Journal.

12. Sollars, Ralph D. "The Relationship of Size of Elementary Schools to Operational Cost and Program Quality," Unpublished Ph.D. dissertation, The Ohio State University, 1962.

While past studies have indicated a general consensus that minimum size for elementary schools should be approximately 180 pupils, the author finds that advantages are greatest in the 300 to 499 pupil range when all indicators are considered and concludes that this is the desirable size range for elementary schools housing grades 1 through 6.

H. Health, Safety, and Sanitation.

1. Creative Planning of Educational Facilities, Chapter 11.

2. From School Program to School Plant, pp. 67-68, 211-212, 354-357, 453-459, and Chapter 20.

3. Blatner, Henry L., and Stephens, Donald J. "Suggestions for Plumbing and Sanitation in School Buildings," American School and University, pp. 415-418, 1954-1955.

"Careful attention to allocation of space and logical use of sanitary facilities as an educational device is most important during formulation of the educational program." The authors offer 44 helpful suggestions as a guide to planning plumbing and sanitation facilities in the comprehensive school program.

4. Campbell, E. A. "Fire Safety Fizzles Out," Nation's Schools, 82:44-46, December 1968.

This article discusses the current status of fire prevention. It is very critical of present conditions and presents adequate research to back up the positions. The author brings out the very real danger of fires.

5. Clar, Milton, and Elliott, Ralph K. "How to Make Trash Compactors Pay Off In School Buildings," American School and University, 46:1 (September, 1973), 24-31.

   The article argues the advantages of switching from traditional incinerator disposal methods to trash compactors. (1) conformance to "no-burn" anti-pollution regulations, (2) better housekeeping, (3) cost savings, (4) manpower savings, (5) and savings on incinerator upkeep. Various types of compactors are described with advantages and disadvantages of each noted.

6. Finchum, R. N., and Boerrigter, Glenn C. School Fires: Prevention, Control and Protection. U. S. Department of Health, Education, and Welfare, Office of Education, Washington, D. C., U. S. Government Printing Office, 1962.

   Many magazine articles, pamphlets, and publications on specific aspects of school fires are available, but few publications present an overview for a complete program of school fire safety. This publication brings together in one document the latest available information, research, and proven practices so that administrators and others who have authority and responsibility in this area may plan a comprehensive program of school plant equipment. A 31 point safety checklist is provided.

7. Greenlagh, John. "Early Warning Systems Assure Safe Schools," School Management, 17:10 (November/December, 1973), 19-22.

   Faced with recurring building fires and break-ins, a Connecticut school system installed an "early warning system" consisting of a total plant fire detection system wired directly to the fire department and a high-frequency beam trespasser system. Components and implementation procedures are discussed.

8. National Academy of Sciences -- National Research Council. School Fires: An Approach to Life Safety, Washington, D. C.: The Council, 1961.

   A school fire safety program must be predicted on the assumption that a fire may start in spite of all prevention efforts. Such a program must foresee all reasonable means of coping with fire and insuring against danger to life. This can be accomplished by early detection of the fire's presence, by the prompt sounding of an alarm, and by effecting swift evacuation of the threatening premises, as well as by combating the fire, controlling its harmful emissions, and guarding against accidents and panic. This publication provides information for the school plant planner concerning desirable design elements, equipment and material specifications, and fire prevention devices.

9. Quinn, R. J. "What Must Be Done for Fire Safety," American School Board Journal, 138:32-34, March 1959.

   While such devices and installations as automatic alarm systems, heat-triggered sprinkler systems, and fire department inspections are important, the best fire presention measure is excellent housekeeping. Chicago's Fire Commissioner Roger J. Quinn offers 18 recommendations for assuring a fire-safe building.

10. Ziff, Stephen. "Better Safe Than Sorry," School Management, 17:7 (August/September, 1973), 40-41.

    An argument for and description of an adequate emergency lighting system for schools.

I. Multi-Use Facilities.

1. Guide for Planning Educational Facilities, pp. 95-96.

2. From School Program to School Plant, Chapter 19.

3. Planning America's School Buildings, Chapter 3, 4, and 5.

4. Community/School: Sharing the Space and the Action. A report from Educational Facilities Laboratories, 1973.

   Community schools open their doors to the public after school hours. Community/schools do not differentiate between school hours and public hours because entire building is operated for the benefit of people of all ages in the community and is paid for and operated by educational and other public service agencies. Booklet sets forth procedures to initiate and develop community/schools; discusses financing, planning, building, staffing and operating facilities shared by schools, health services, parks and recreation, day care centers, senior citizens services and legal aid.

5. Passantino, R. J. "Community/School Facilities: The Schoolhouse of the Future," Phi Delta Kappan, LVI:5 (January, 1975), 306-10.

   The author traces the development of the community school and points to examples of such schools today. What we know as the community school is only the beginning, however, as Passantino cites experiments going on in Europe which more adequately point to the future of the schoolhouse. In the example cited the schoolhouse is just one part of a complex housed under one roof that includes a day-care center, a pre-school, a library, a physical education field house, a teen center, a leisure time center, a club for the elderly, medical,dental and social service facilities and commercial shops including a supermarket, drugstore and cafeteria. This is what Passantino sees as the evolution of the schoolhouse to the community school.

6. Ringers, Joseph, Jr. "Interagency Cooperation Will Build Tomorrow's Schools," American School and University, 45 (March, 1973), 32-42.

   A program is outlined for possible cooperative planning of community recreation facilities used by educational agencies and community recreation departments. Guidelines for effective cooperation are provided.

7. "The Truth About Multi-Purpose Rooms," School Management, 2:40-44, April 1958.

   Multi-purpose rooms planned as an approach to economy in construction can handicap the educational program. However, by considering the basic requirements for various activities some combination of facilities with a resulting saving can be made.

J. Operation, Maintenance, and Vandalism.

1. From School Program to School Plant, pp. 123-124, 191-193, 371-373.

2. Planning America's School Buildings, Chapter 14.

3. Bried, Raymond. "Design Your Plant to Avoid Maintenance Sore Spots," Nation's Schools, 83:100-102, April 1969.

   The author in this article points out the maintenance problems that are created as a result of poor planning vandalism that typically occurs in public schools.

4. Feldman, Edwin B. "Cut Costs and Win Friends By Planning Or Remodeling Schools for Easy Maintenance," Nation's Schools, 92:1 (July, 1973), 36-38.

   Very often in an attempt to save on initial building costs, building planners increase long-range costs by increasing maintenance problems. Feldman discusses ways in which initial building design can reduce maintenance, giving special attention to entranceway design, restrooms, and custodial storage areas; the articles includes a series of suggestions to aid maintenance reduction.

5. Finchum, R. N. School Building Maintenance Procedures, U. S. Department of Health, Education, and Welfare, Office of Education, Bulletin 1964, No. 17, Washington, D. C.: U. S. Government Printing Office, 1964.

   Maintenance of school buildings in an adequate manner is a problem which concerns taxpayers and school officials alike. This publication identifies, describes, shows the function of and outlines the maintenance procedures for many components of school buildings.

6. "Good Maintenance Practices: A Symposium," American School and University, pp. 423-432, 1966-67.

Plant operation is one important cog in a "wheel" designed to implement an accepted philosophy of education for a particular community. Efficient plant operation within this framework requires attention to a number of factors. These are: Personnel selection and orientation, organizational arrangements, equipment requirements and public relations.

7. "Maintenance Practices: A Symposium," American School and University, pp. 273-284, 1957-1958.

   A collection of articles outlines maintenance practices currently employed in various schools. Articles in this symposium are:

   a. "A 5-point Training Program (for custodians)"
   b. "Maintenance Practices for New School Buildings"
   c. "Training School for Custodial Service Employees"
   d. "Maintaining Interior Painted Surfaces"
   e. "Custodial Staff Selection"
   f. "Heating Maintenance in Ithaca, New York"
   g. "Cutting Costs in Grounds Maintenance"
   h. "Supplying Heat to the Detroit Public Schools"
   i. "The Importance of Maintaining School Grounds"

8. O'Grince, Sylvester, and Hodgins, Harry S. "Public School Vandalism: How Baltimore Fights It." American School and University, 40:30-32, July 1968.

   This article points out clearly the very real problem of vandalism, especially in urban areas. Both successful and unsuccessful approaches to preventing burglary and vandalism are discussed. This includes some illustrations.

9. Schnabalk, Charles. "Safeguarding the School Against Vandalism and Violence," Nation's Schools, 94:2 (August, 1974).

   Even the most carefully designed learning environment and equipment are damaged, defaced or stolen. System design and various types of security systems are discussed. Silent alarms, local alarms, mechanical detectors, closed circuit television, and other security measures are analyzed for use and pros and cons presented.

10. Staerkel, W. M., and Carroll, J. M. "How to Get Repair Jobs Done Right and Done on Time," The Nation's Schools, 72:59-64, October 1963.

    Maintenance in the public schools is not a single service. Preventive maintenance, emergency maintenance, major and minor maintenance are all facets with differing purposes and calling for varied competencies which must be organized and administered into a carefully controlled program. The author of this article offers suggestions as to how to accomplish this organization and administration. Charts included illustrate a weekly master schedule, a time accounting form, a blueprint for collecting information about the various jobs performed and a summary of what one should know to make sound maintenance plans.

11. State of Florida, Department of Education, School Plant Operation and Maintenance Programs in Florida Counties, Tallahassee: The Department, 1959.

This is a report relating to the salient aspects of county programs of school plant operation and maintenance. The purpose of this publication is to give information to school administrators, school boards, maintenance supervisors, custodial supervisors, and all others interested in operating and maintaining school plants.

K. Relocatable and Mobile Classrooms.

1. "All About Classrooms Made to Travel," American School and University, 39:32-33, June 1967.

This article is concerned with school activities that make use of a traveling classroom. The article consists primarily of specific uses that have developed for these classrooms on wheels. Illustrations are included.

2. Educational Facilities Laboratories, Relocatable School Facilities. New York: The Laboratories, 1964.

This report has been prepared to define more clearly the problems that have led to the need for relocatable housing, to present some guides for planning such buildings, and to review experience in the field. Pictures and illustrations are provided of some types and styles of relocatable school facilities now in use.

3. "Metal Building Systems Fit to be Tried," Nation's Schools, 94:1 (July, 1974), 34-35.

The article argues the advantages of metal building systems in constructing school facilities. No longer the "airplane hangar" style of construction, metal systems offer the advantages of lower initial cost, reduced maintenance, flexibility and predictability of cost.

4. "Planning for Relocatable Buildings," American School and University, 45:1 (September, 1972), 58-62.

Relocatables, buildings which have no wheels but which can be moved easily, are not desirable, but are sometimes necessary for school use because of temporary enrollment increase or insufficient funds to build a permanent structure. The article discusses aspects of the use of relocatables in the system: placement, price, and specifications.

5. "Schoolmen Re-discover Relocatable Classroom," Nation's Schools, 82:32-40, December 1968.

"Relocatables" are described extensively in this article. In addition to advantages, disadvantages, and various types of relocatables, numerous examples of their use, including pictures and illustrations, are covered.